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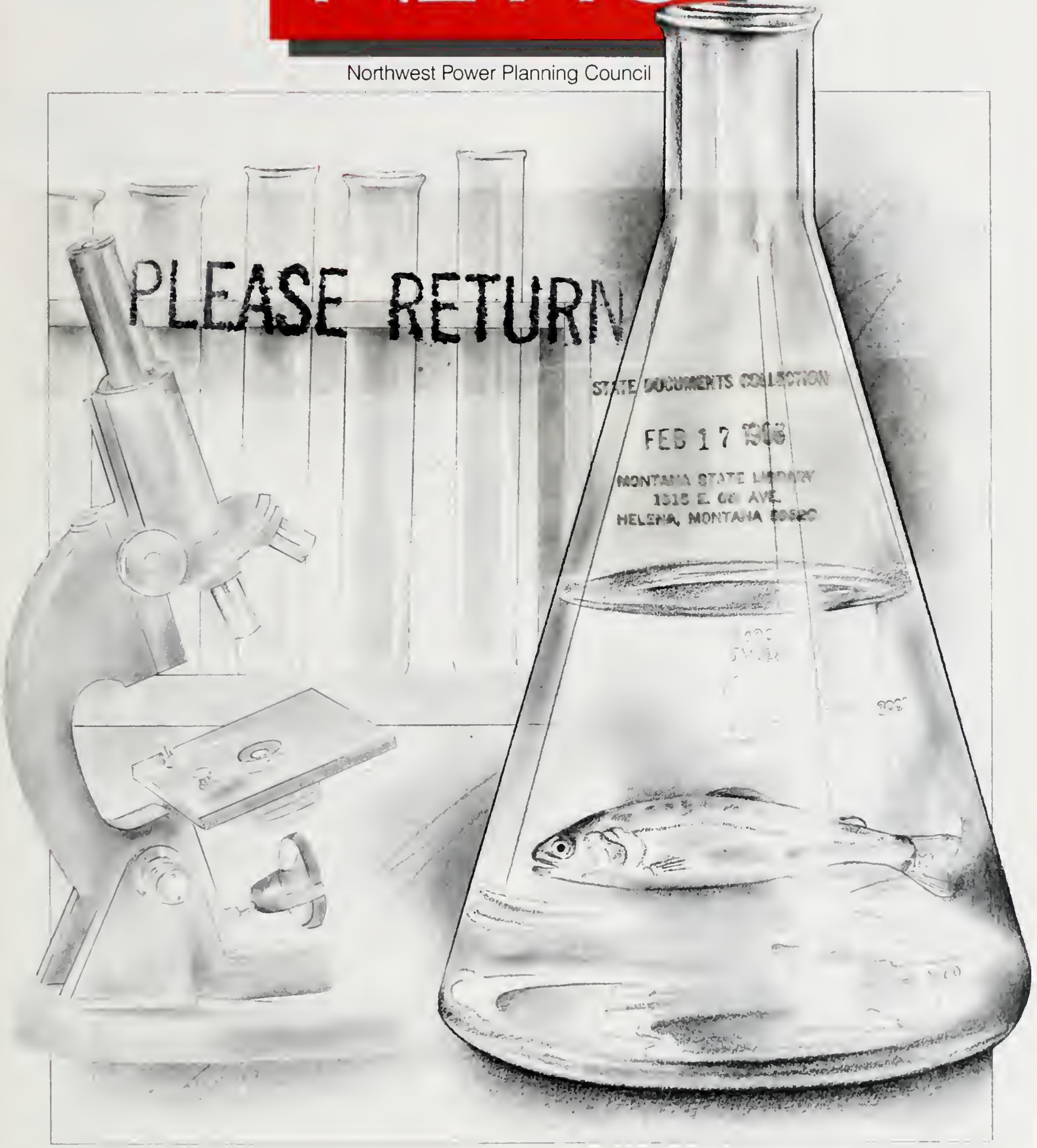
NORTHWEST ENERGY NEWS

Northwest Power Planning Council



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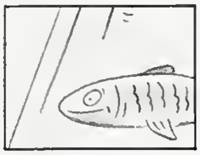

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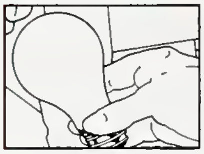

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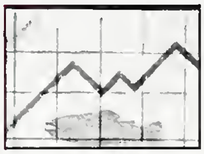

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Columbia Basin experts are finding ways to evaluate fish and wildlife program successes and failures.

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Editor's Notes

Yes, this is still *Northwest Energy News*. The new look is our way of saying we're enthusiastic about the changes taking place in the region. This issue explores some of those changes — new technologies in the fish and wildlife program, new participants in the region's Super Good Cents conservation marketing program, and new energy-efficient lighting systems.

With this issue we also say good-bye, for now, to two Council members. Member Kai Lee, from Washington, actually resigned from the Council just as we were going to the printers with our last issue. We took the time to change the Council member listing, adding R. Ted Bottiger, Lee's replacement who joined us after leaving the Washington State Senate, but we never announced Lee's return to his post at the University of Washington.

Then, just as we were about to put this issue "to bed," one of the Council's founding members, Montana's Gerald Mueller, also announced his resignation. After more than seven years' involvement in the Northwest's energy scene, Mueller wants to take more time to be with his family.

Montana Governor Ted Schwinden has picked his Lieutenant Governor George Turman to replace Mueller. Before his term as lieutenant governor, Turman served as a Public Service Commissioner for the state of Montana.

COVER ILLUSTRATION: This issue's cover art was drawn by Lynn Carson.

NOTE: NEW ADDRESS

The Northwest Power Planning Council has a new address. No, we have not moved, but the post office has requested we use a different mailing address. Our building fronts on both Broadway and on Sixth Avenue. Each street has a separate zip code. To simplify delivery, the post office has asked us to join the rest of this building's occupants and change our address to reflect the Sixth Avenue zip code. Hence, our new address is:

Northwest Power Planning
Council
851 S.W. Sixth Avenue,
Suite 1100
Portland, Oregon 97204

Montana State Library
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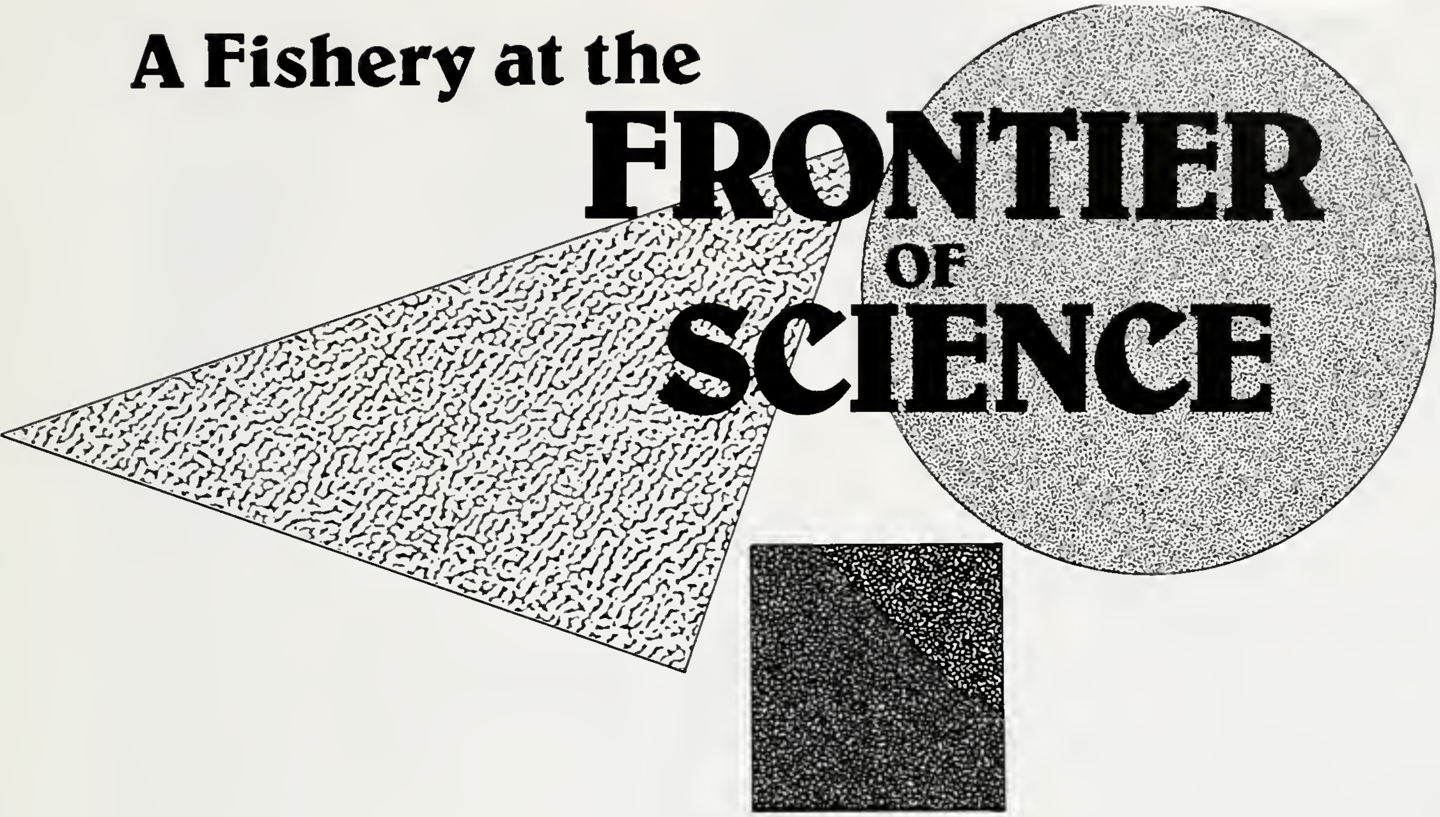
A Fishery at the FRONTIER OF SCIENCE



In a quiet laboratory at Oregon State University's Corvallis campus, microbiologists with a special interest in fish diseases are delicately splicing genes and cloning bacteria.

Through genetic engineering, these scientists are developing immunization techniques that should help salmon and steelhead resist the deadly virus known as infectious hematopoietic necrosis or IHN. Since the late 1970s, more than 25 million salmon and steelhead eggs have been destroyed because they were infected with the IHN virus. The potential value of these losses has been estimated at $250 million.

Elsewhere on campus, other scientists are studying the health effects of six vitamins—C, B6, E, folic acid, pantothenic acid and riboflavin—on young salmon and steelhead. Most biologists agree that these vitamins strengthen human and domestic animals' resistance to certain infections. The Corvallis researchers believe the nutrients will do likewise for hatchery-reared Columbia River Basin smolts. Their goal is to find an economical way to enrich fish feeds in hatcheries where over 80 percent of the basin's salmon and steelhead are produced.

In Washington's Yakima River Basin and in Idaho's Salmon and Clearwater river basins, experimentation revolves around the effects of introducing hatchery fish into streams that normally support runs of wild or "naturalized" salmon and steelhead. In the first years of the projects, researchers will be carefully cataloging the timing and distributions of the runs that are already extant in these basins so they may eventually be able to monitor any life-cycle changes wrought by sowing new fish into these communities.

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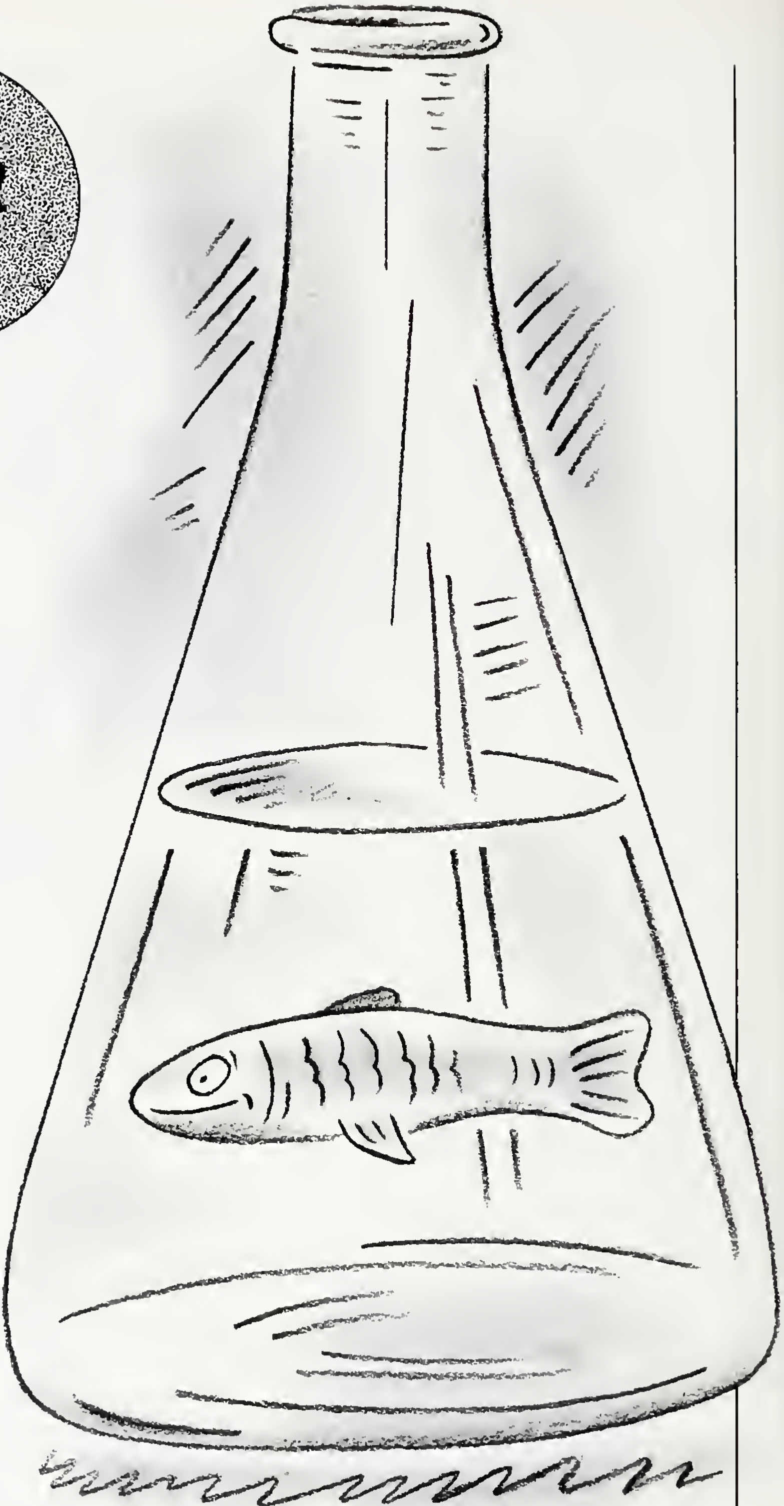


Most of this work, and that described below, is unique to the Columbia River Basin. Some of it has been carried out in other regions — the Great Lakes or the Northeast — but without the diversity of participation or degree of detailed analysis evident in the Northwest. Some of it has been under way for many years.

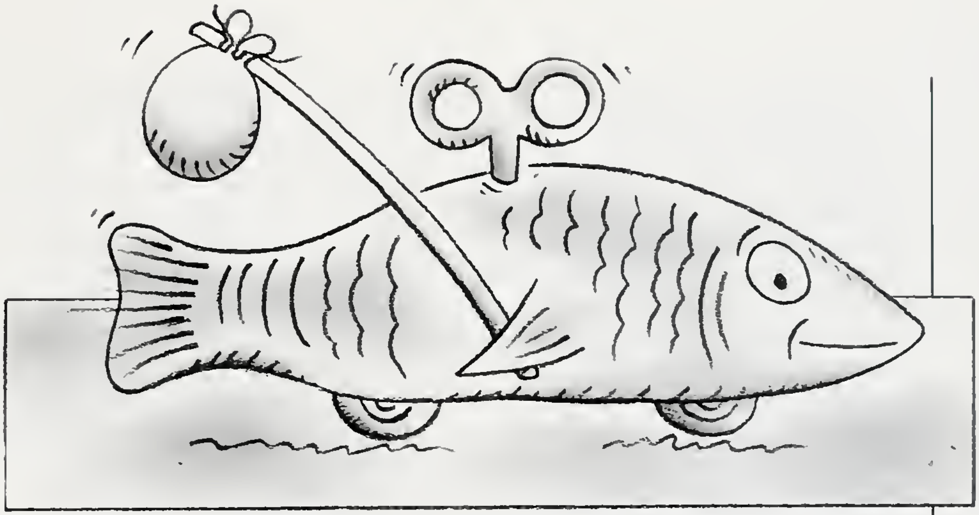
But in the Pacific Northwest, particularly in the watershed of the Columbia, what distinguishes these labors from other research efforts is the fact that all these studies have the same goal — to double salmon and steelhead runs in the basin.

Unified by the Northwest Power Planning Council's Columbia River Basin Fish and Wildlife Program, these various projects are applying the most contemporary scientific technologies to the confounding problems facing a fishery just now pulling back from the edge of extinction.

Illustrations by Lynn Carson

During the summer of 1987, teams of Northwest scientists, engineers and others met to set salmon and steelhead research strategies for the next five years. They formed work groups according to areas of emphasis defined in the fish and wildlife program. They focused on making hatcheries more efficient and effective; reducing fish losses from diseases; improving fish survival in reservoirs and through mainstem Columbia River dams; and ensuring that hatchery-bred fish released among native fish do not endanger wild populations.

Over the next five years and on into the early part of the next century, the achievements of these scientists on the fisheries frontier will vary from subtle to significant. Their findings will be shared and compared, not just among the basin's scientists, but among fisheries researchers worldwide, who have watched the decline and now the tentative beginnings of recovery of one of the world's great natural resources. As each new strand of information and each successful experiment is worked into the fabric of the Columbia River Basin program, the rest of the fisheries community, spread out wherever salmon and steelhead still exist, will be taking notes.



Imitating Life: Computer Models Salmon Migration

In 1980, a handful of bright young physics graduate students took it upon themselves to use computer technology to crack the roulette wheels at gambling casinos in Las Vegas, Nevada. They developed a set of reference data about the spin of the wheel and the speed of the ball's slide toward the wheel's center.

A simple relay device installed in one of their shoes was used to tap out a code between the student at the wheel and a comrade who calculated the chances of the ball settling on a given number. Their unconventional collaboration netted them about a 40-percent advantage over the unassisted better. While they were still investing in a game of chance, they had definitely improved their odds.

Repairing damaged ecosystems generally offers better potential for controlled outcomes than does a roulette wheel, but there are still basic uncertainties, not the least of which are the complexity of possible causes and the unpredictability of effects.

Until recent years, fisheries management was largely an unaided guessing game. Researchers took direction from the past, added the wisdom of the moment and tried to predict the outcome of events in the future. Now, with the assistance of computer simulation models, the likely effects of actions can at least be explored before major expensive actions are taken.

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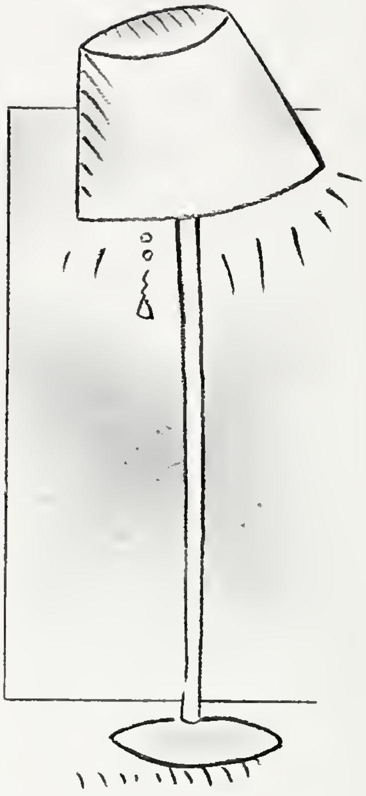
With the computer simulating a range of possible outcomes from fisheries experiments, for example, the odds of decision makers selecting appropriate actions are improved. Such a model is being developed as part of the Northwest Power Planning Council's Columbia River Basin Fish and Wildlife Program.

By applying computer modeling technology to the life cycle of a salmon or steelhead in the Columbia River Basin, scientists are now able to incorporate far more elements and options than they could consider without computer assistance. The Council's model incorporates information contributed by biologists and others in a series of workshops held throughout the Northwest in 1986. Participants shared the contents of their file cabinets with each other, compiling details about the fish at various stages in their life cycle and in different environments. In continued meetings, the model is being tested and refined. Thus, the model is designed to reflect the collective wisdom of the fisheries community.

This broad base of data is essential because the model can only summarize and review what it is fed—complete with prejudices and preconceptions. If the information in the computer is biased, the model will share that bias. The computer does not increase the amount of information it works from; it merely organizes it and draws conclusions that may appear to be additional facts, but are actually only reasonable conjectures.

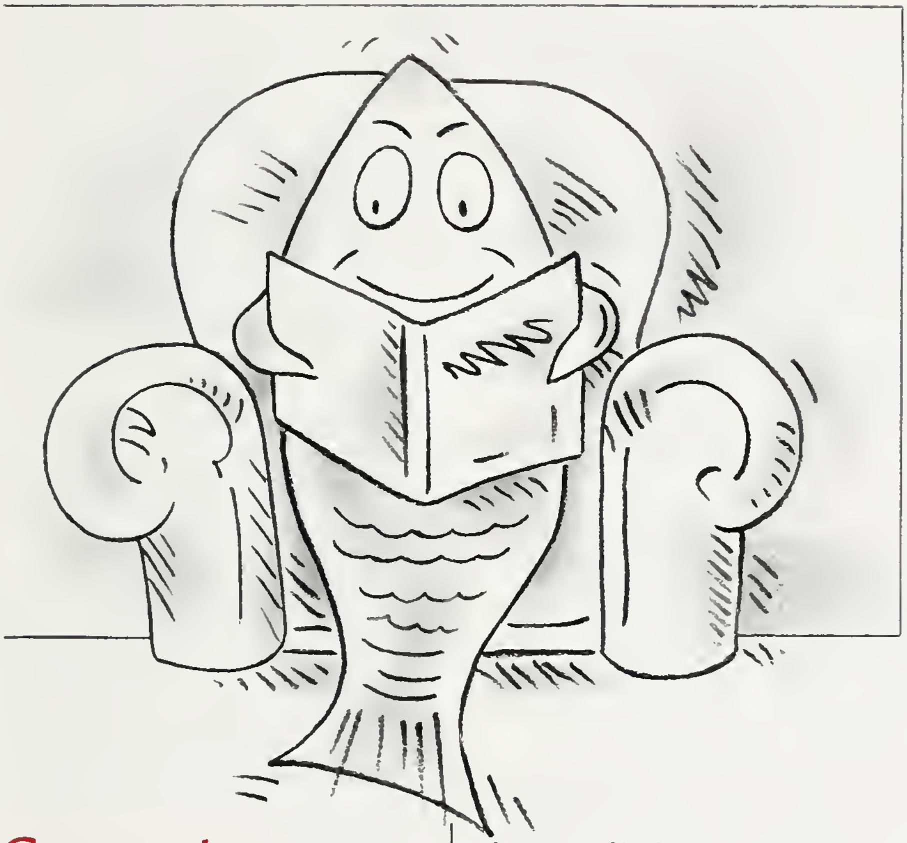
By playing data off other data or reducing data mathematically (taking annual averages, for example, and calculating what daily or even hourly averages might look like), the computer may appear to give a greater understanding of the ecosystem than the scientists who originally supplied the numbers. It still falls to the model's users to distinguish the computer as crystal ball from the computer as educational tool.

In use, the model will likely be most helpful during the Council's system planning process. In system planning, 31 individual river basins will be studied to determine each one's potential contribution to the goal of doubling salmon and steelhead runs in the Columbia Basin. The model can help select the mix of activities that will best provide long-term returns from ratepayer investments in the fish and wildlife program.



Much like the computer-assisted physics students, participants in the fish and wildlife program will gain an edge over the uncertainties of nature by enlisting the aid of technology.

—CC



Computer Catalog of Fish: Salmon and Steelhead Database

Which streams in the Northwest have salmon and steelhead habitat that is not being used? Which are important to citizens because of valuable recreational opportunities? And, at which sites can a hydroelectric project be located with little chance of it destroying the value of a stream? These are questions asked regularly by planners in the Northwest, but until recently there was no easy way to find the answers.

That is changing. The information planners need will be easily available on their computers in the near future. Under the Northwest Power Planning Council's program, the first regionwide, detailed data bases have been developed containing the information needed to plan the future of Northwest rivers.

The first of the new data bases catalogs information about anadromous fish. It characterizes stream reaches throughout the region, based on whether they contain salmon or steelhead, their importance as migratory routes for the fish, and their value as potential spawning and rearing habitat.

The second, produced by the Bonneville Power Administration's Rivers Assessment Study, identifies the significance of each stream, based on such values as wild and scenic rivers status, resident fish or wildlife use, recreational use, cultural values (for example, historical or archaeological significance) and natural features.

Finally, there is a data base developed by the U.S. Army Corps of Engineers and Bonneville. It contains specific information on existing and proposed hydroelectric projects in the Northwest — information such as the generating capacity and location of each project.

By cross-referencing between the three data bases, a very clear picture of each Northwest stream can be generated. This information is being used to map the distribution of various stocks of salmon and steelhead in stream reaches throughout the Northwest; to determine

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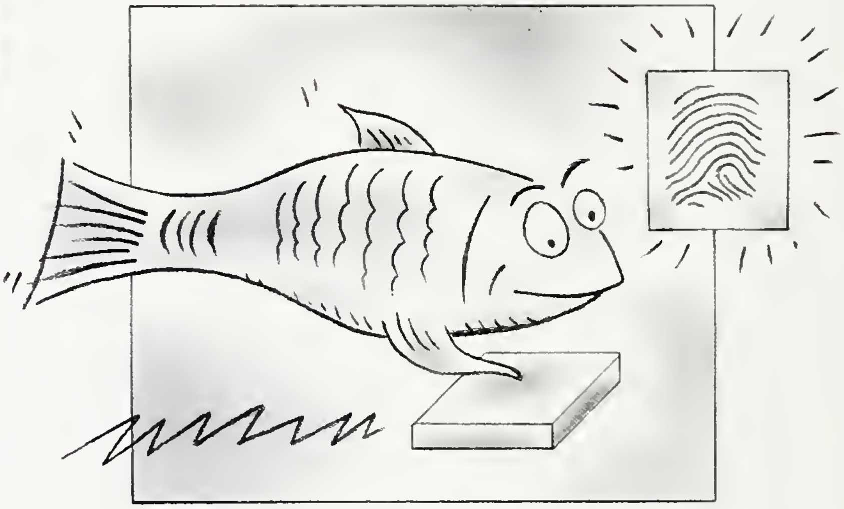
which, if any, areas in the basin should be protected from hydropower development; and to estimate how much hydropower the Northwest can reasonably expect to develop without damaging its rivers.

Other uses also are being found for the data bases. Last year, Idaho's Department of Fish and Game used that state's section of the data base to catch wildlife poachers. Through an anonymous phone call, the department learned that deer were being killed illegally along Rock Creek. The poachers would wait in their pickup for a deer coming to drink. They would turn a spotlight on the deer and, when it froze, they would shoot it.

Unfortunately, there are six Rock Creeks in Idaho, and the folks at the Department of Fish and Game didn't know which one the caller referred to.

Then someone remembered the data base. Using listed environmental factors, Idaho's data coordinator searched for a Rock Creek that had deer habitat and that a pickup would be able to get to. Only one matched. It turned out to be the correct creek, and the poachers were arrested by the local game warden.

—RLC



Fingerprinting Fish: Electrophoresis

The overworked detective studied the lab results and his spirits lifted, "Just as I suspected, Sir Reginald's blood wasn't the only blood spilled that night. The electrophoresis shows two different types of blood on Sir Reginald's smoking jacket."

Just as forensic biologists use electrophoresis to figure out "who done it," fisheries biologists are beginning to use the technique to answer the question "who are they?" Electrophoresis allows them to determine fish origins by analyzing the genetic variation in fish body fluid and muscle tissue within hours of sampling. The Northwest Power Planning Council's fish and wildlife program includes a five-year demonstration project that uses the technique to determine the genetic profile of salmon stocks in the ocean. The speed of the analysis helps harvest managers "shape" fishing seasons to protect some stocks while permitting others to be caught. Electrophoresis may also be used to monitor changes in genetic makeup of streams "seeded" with hatchery-bred fish.

Because salmon return from the ocean to reproduce in the stream where they were born, they develop distinct genetic patterns which tie them to their birthplace and to the season in which they were born. Some of the genes produce different proteins that scientists can extract from body tissues such as liver and muscle. By putting these fluids in a starch gel and subjecting the gel to an electric current, different genetic types of a protein can be distinguished because they have different electrical charges.

When a starch gel containing extracts from several fish is stained, a pattern showing these protein variations becomes evident. By studying these patterns, scientists can determine genetic profiles for various fish stocks. These profiles act as a sort of "fingerprint," which geneticists use to estimate the probability that fish sampled from stock mixtures belong to a particular stock. The technique should help fisheries managers distinguish between hatchery-produced and naturally produced fish, an important distinction for those who manage ocean fish harvests.

In criminal forensic medicine, biologists have used electrophoresis to test blood serum, enabling them to narrow down suspects when blood is left at the scene of a crime. In fisheries biology, electrophoresis is used to trace the roots of fish stocks, enabling fisheries managers to determine which stocks should be caught and which should be restricted. Thus, modern science is helping man catch both felons and fish.

—PMW

Upping the Yield: Oxygen Supplementation

The primary factor that limits the number of fish a hatchery can produce is the volume of water available (either physically or economically). Normal activities of fish result in a variety of changes in water quality. The most important effect is that, like other living organisms, the fish absorb oxygen from the water and release carbon dioxide into it.

The natural flow of a river provides fish with a steady supply of oxygenated water. But in a hatchery, new water must be circulated to keep fish healthy. Normally, water is passed through the hatchery ponds twice. But, through a process called "oxygen supplementation," the now oxygen-depleted water is reaerated so that it can be used a third time. This allows more fish to be reared within the existing facility.

Dramatic results with oxygen supplementation have been reported for trout and

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steelhead hatcheries in the Great Lakes area. The first major experiment with the technique in the Northwest will take place at a planned salmon and steelhead hatchery on the Umatilla River in northeastern Oregon. Earlier this year, the Northwest Power Planning Council approved expansion of the hatchery's master plan to include testing of oxygen supplementation.

The Umatilla hatchery is considered a good choice for testing the concept of oxygen supplementation because it would rely entirely on groundwater, thus eliminating outside sources of contamination. This decreases the possibility of disease spreading from the hatchery into streams or rivers. The process will raise the capital cost of this hatchery from $7 million to $8 million, a 14-percent increase. However, it is estimated that it could raise the hatchery production capacity from 160,000 pounds to 290,000 pounds, a 55-percent increase. This would result in a dramatic decrease in the cost per pound of fish.

—DM

Natural Rearing: Outplanting and Supplementation

Fisheries biologists have been looking for ways to integrate hatchery production with natural production. One way is through a process known somewhat interchangeably as "outplanting" or "supplementation." The first term refers to the process, while the second refers to the effect of the process.

Hatchery-bred fish are "outplanted" into natural habitats for rearing, and the hoped-for result is that natural fish stocks will be "supplemented."

Researchers look to a variety of positive effects. They hope that the technique can be used to reseed certain barren areas and provide harvest opportunities in key streams, as well as rebuilding natural runs. While still in the experimental stage, outplanting has been carried out throughout the Northwest and Alaska. However, in the past it had not been subjected to rigorous scientific study.

With outplanting, juvenile fish at various stages of development would be transferred from the hatchery to streams. This frees up hatchery space for new breeding and makes use of natural rearing habitat. The largest outplanting experiment will begin soon in central Washington's Yakima and Klickitat river basins. The Northwest Power Planning Council recently approved preliminary design work there for a state-of-the-art outplanting facility.

The facility promises to become a laboratory for testing the effectiveness of supplementing local stocks. The project is expected to produce 10 million smolts within a decade. These could include spring, fall and summer chinook; early run coho; and summer steelhead.

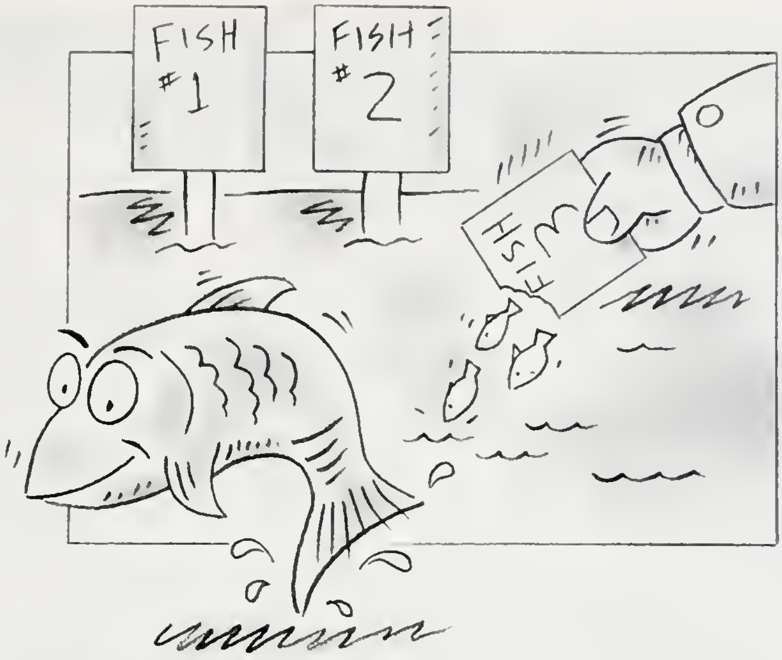
While many fisheries experts believe outplanting is the key to sustained yields of fish, they are also aware of certain risks. There are a number of uncertainties related to outplanting, such as genetic implications, the effects on other fish species in the natural habitat, and the impact on overall fish survival and productivity. For example, one uncertainty concerns planting densities — how many smolts can be released at a specific site before survival begins to diminish? Of particular concern is how hatchery fish can affect survival rates of other fish by either dominating or displacing local stocks. The genetic diversity of the local stocks could be at risk.

Because of these uncertainties, the outplanting programs must be designed to provide long-term, stringent monitoring and data collection. At the Yakima/Klickitat project, biologists will mark all outplanted fish with coded wire tags and will develop a computerized record-keeping system. They will study the timing and numbers of fish migrating to and from the ocean; the maturation schedules and size of the outmigrants; the number of fish harvested throughout the migratory range; the size, sex and age of returning adults; and survival rates both from egg to smolt and from smolt to adulthood.

Sites for releasing young fish must also be chosen with care. The water needs of various stocks must be analyzed. Project operators will look at water quality, availability of suitable flows, site-related considerations (roads, proximity to hatchery, etc.), and land-use factors. Because of the scarcity of water in the area, hatchery managers will also work closely with irrigators.

While outplanting has been tried elsewhere with both success and some failure, the Yakima/Klickitat project will be the largest scale and most rigorously scientific test of outplanting ever. Fisheries experts all over the world will be watching the results.

— DM

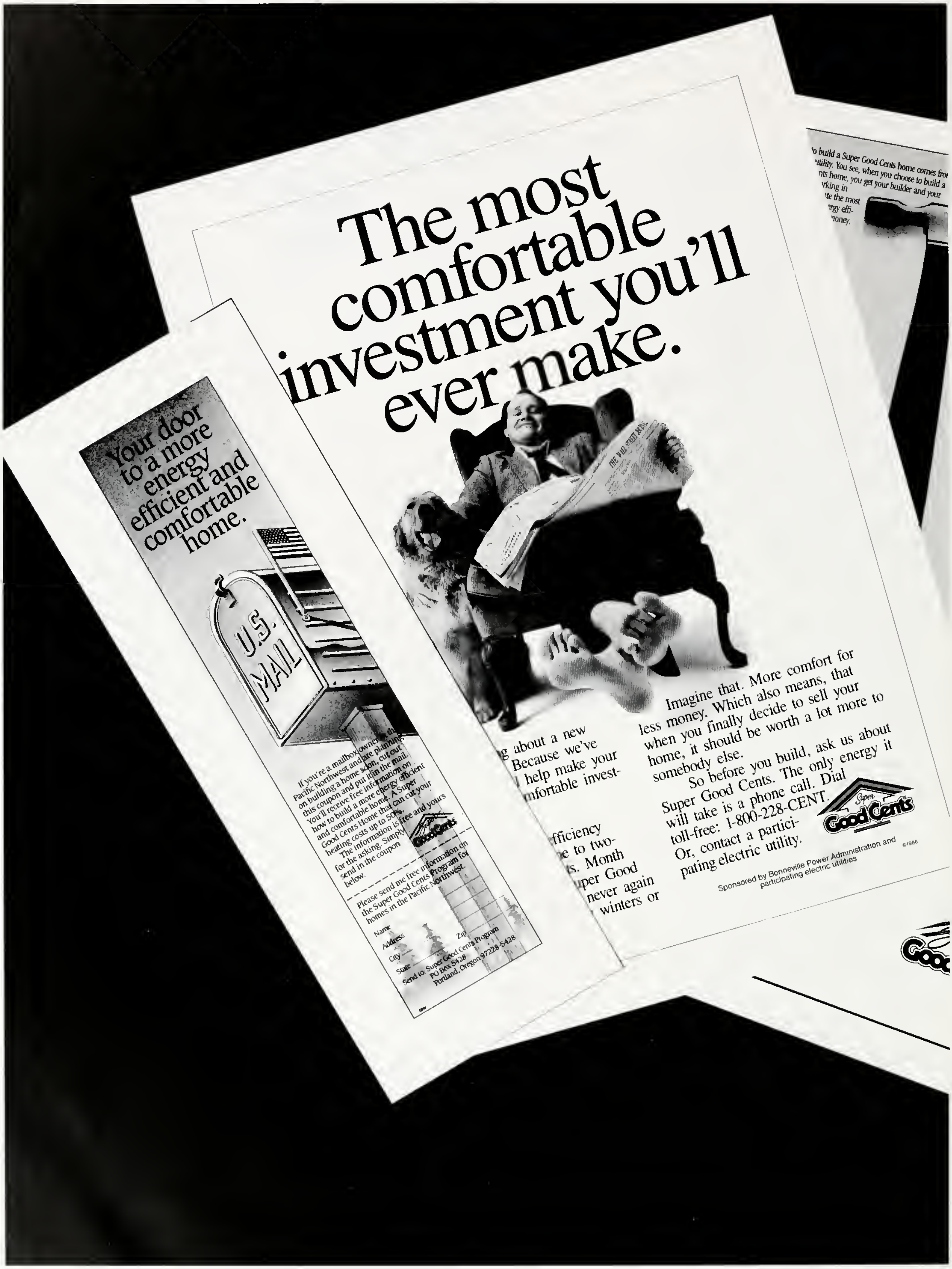


Reseeding the Rivers: Imprinting

One of the many mysteries of the salmon's unique life cycle is the fish's homing instinct. After three to five years migrating thousands of miles in the ocean, surviving adult salmon will usually return to spawn in the exact stream reach in which they themselves were spawned. No one knows exactly why this is so, but the conjecture is that the peculiar characteristics of an individual spawning environment are somehow "imprinted" in each salmon at a very early developmental stage.

Ordinarily, hatchery-bred fish would be expected to return to their hatchery to spawn. Such fish are frequently put into acclimation ponds prior to release in streams to improve their chances for survival. By filling these ponds with water from the streams into which the young fish will eventually be released, researchers hope to duplicate nature's imprinting process for that stream. If this process can work on a large scale, it will mean that some natural stream reaches now depleted of fish could be repopulated.

— DM



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Imagine that. More comfort for less money. Which also means, that when you finally decide to sell your home, it should be worth a lot more to somebody else.

So before you build, ask us about Super Good Cents. The only energy it will take is a phone call. Dial toll-free: 1-800-228-CENT. Or, contact a participating electric utility.

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Your door to a more energy efficient and comfortable home.

If you're a mailbox owner in the Pacific Northwest and are planning on building a home soon, cut out this coupon and put it in the mail. You'll receive free information on how to build a more energy efficient and comfortable home. A Super Good Cents Home that can cut your heating costs up to 50%.

The information is free and yours for the asking. Simply send in the coupon below.

Please send me free information on the Super Good Cents Program for homes in the Pacific Northwest.

Name
Address
City
State
Zip

Send to: Super Good Cents Program
PO Box 5428
Portland, Oregon 97228-5428

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Super
d Cents

by Paula M. Walker

Balloons, wine coolers and Superman are a far cry from R-value insulation levels, air leakage controls and advanced framing. But for some utilities they play an equally important role in promoting energy-efficient housing in the Pacific Northwest. They are all promotional tools for the Super Good Cents program, which encourages energy efficiency in new electrically heated homes.

Sponsored by the Bonneville Power Administration, the Super Good Cents program represents an alternative to building codes for implementing the model conservation standards called for in the Northwest Power Act of 1980. Operated by local utilities, the voluntary program combines advertising, technical assistance, training and financial payments to encourage the construction of electricallyheated homes that meet high standards of energy efficiency. As of January 1, 1988, more than 100 utilities had signed up for the Super Good Cents program.

When the Super Good Cents program began in 1985, it initially met resistance both from builders who were unfamiliar with energy-efficient building techniques and from home buyers who imagined energy-efficient homes as small, dark, airtight boxes wrapped in plastic, allowing no architectural creativity. To overcome those biases and to promote construction of Super Good Cents homes, many utilities have developed creative marketing strategies. While Bonneville assists the utilities with general promotional material about Super Good Cents, several utilities have tailored their own marketing programs to the distinct needs of their customers.

Utilities have aimed advertising campaigns either at homebuilders or at people who are thinking about building a new home. Some ads emphasize the value of energy-efficient homes; others focus on local Super Good Cents success stories, using testimonials from builders in the program.

House Plan Dream Book

When it first joined the Super Good Cents program, the Eugene Water and Electric Board conducted an in-depth marketing survey of its customers. The results indicated that people in the Eugene, Oregon, area already supported energy-efficient housing and were willing to pay more for an energy-efficient home. Consequently, the utility focused much of its promotional effort on the building industry.

Activities included a booklet of house plans for Super Good Cents homes and the construction of model homes built to Super Good Cents standards. To encourage builder participation, the Eugene Water and Electric Board offered to reimburse builders for the cost of maintaining the model homes while they were on display.

For the house plans book, the utility ran a design contest for house designers and architects, with a $1,000 award for the winners. To encourage customers to use Super Good Cents house plans, the utility offers to share half the cost of purchasing the plans up to $200.

Bob Lorenzen, Super Good Cents coordinator for the board, says model homes are important not only to give the builder practice in applying Super Good Cents techniques, but also to show prospective buyers the flexibility of energy-efficient home designs. "Model homes help to demystify the impression that the [Super Good Cents] homes are different, that they have less window area, etc.," he says. The Eugene utility is using funds from a weatherization bond they sold a few years ago to pay for parts of their Super Good Cents program.

The Media Markets the Message

Chelan County Public Utility District in central Washington has run television ads featuring two "down-home" characters sitting on the front porch discussing the merits of their Super Good Cents home in the style of popular wine cooler ads. Benton County Public Utility District in southeastern Washington has run ads with a Superman theme: "Wouldn't it be great if you could see through walls?"

Mike Greene, of Chelan's public utility, says the utility has had a difficult time overcoming the stereotype that "a Super Good Cents home is very tight and it sweats." As a result, the utility's advertising campaign promotes the homes' comfort and energy savings. To overcome the impression that the homes limit the number of doors and windows, the utility offers to adapt *any* house plan to meet Super Good Cents standards.

While project-labeled balloons, billboards, door mats and door knockers may seem frivolous to some, utilities have discovered that one cannot underestimate the power of advertising. Converts have come from unexpected places.

Your door to a more energy efficient and comfortable home.
U.S. MAIL
If you're a mailbox owner in the Pacific Northwest and are planning on building a home soon, cut out this coupon and put it in the mail. You'll receive free information on how to build a more energy efficient and comfortable home. A Super Good Cents Home that can cut your costs up to 50%. formation is free and yours Simply
Super Good Cents
The most comfortable investment yo ever make
g about a new Because we've help make your mfortable invest-
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ficiency

One builder even called the City of Tacoma's utility division from his mobile phone while he was stuck in traffic behind a bus that bore a Super Good Cents sign.

Centsable Collaborations

Some utilities with adjoining service areas have stretched their Super Good Cents dollars with cooperative advertising campaigns. Benton County, for instance, belongs to a consortium of utilities that are promoting the program in the Tri-cities area of Washington state. Also in the consortium are the City of Richland, Benton Rural Electric Association, Franklin County Public Utility District, Columbia Rural Electric Association and the Umatilla Electric Cooperative. Together, the six utilities serve about 70,000 residential customers.

Because the utilities often work with the same builders, the consortium has taken pains to coordinate their Super Good Cents programs, so that they are administered consistently in the various service areas. "We try to make sure that each utility enforces the specifications in the same way to avoid confusion among the builders," says Ron Goodman, energy adviser for the Benton County utility.

Another recent cooperative effort between the City of Port Angeles and the Clallam County Public Utility District in northwestern Washington resulted in a "Super Good Cents Week" promotion that included builder training sessions and a home tour of nine Super Good Cents homes under construction. Sheila Hardy, director of conservation for the City of Port Angeles, said at least one builder was asked to build another Super Good Cents home as a result of the tour.

The Personal Approach

Some of the smaller and mid-sized utilities have found that their best promotional aids are word of mouth and one-to-one contact with both builders and prospective new home buyers. Says Hardy, "Our best marketing tool has been our energetic technical representative who drives around town and talks to builders. Those contractors have come in here with their plans the same afternoon after he talks to them."

Lakeview Light and Power near Tacoma relies almost exclusively on one-to-one contact. Because the

u'll
build a Super Good Cents home comes from
utility. You see, when you choose to build a
nts home, you get your builder and your
rking in
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savings. That's Super Good Cents. So before you build,
contact your electric utility about the Super Good Cents
Program. It could give your builder the power to build a
better home. And you the power
to save more money.
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gine that. More comfort for
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it should be worth a lot more to
ody else.
So before you build, ask us about
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take is a phone call. Dial
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utility's service area encompasses only eight square miles, its program representative is able to visit every Super Good Cents construction site to conduct inspections and answer builders' questions. The utility boasts that 88-percent of the new homes constructed are Super Good Cents buildings. Most of the energy-efficient construction in the utility's service area has been in multi-family dwellings.

Builders Training

While advertising and marketing play an important role in these promotional efforts, some utilities have focused on the training and technical assistance aspects of the program. Bonneville supplies participating utilities with training materials and tapes to instruct builders on various energy-efficient construction techniques. Several utilities, including Snohomish County Public Utility District, Gray's Harbor County Public Utility District, and the City of Port Angeles have worked with carpentry classes at community colleges, vocational-technical schools or high schools to encourage the construction of a Super Good Cents home as a class project.

Says Joann Hansen, Super Good Cents coordinator for Gray's Harbor County Public Utility District, "These are the future builders of America. They have been very receptive to the new techniques. And the instructor at the community college loves the Super Good Cents program." Hansen said that two Super Good Cents builders in her service area conducted program training at the college.

The Eugene Water and Electric Board publishes a technical newsletter for builders and other members of the housing industry. Called "Building Cents-ibly," the newsletter provides technical tips for building energy-efficient homes and features a different Super Good Cents builder in each issue. Chelan County has paid registration fees for builders who participate in Super Good Cents training programs.

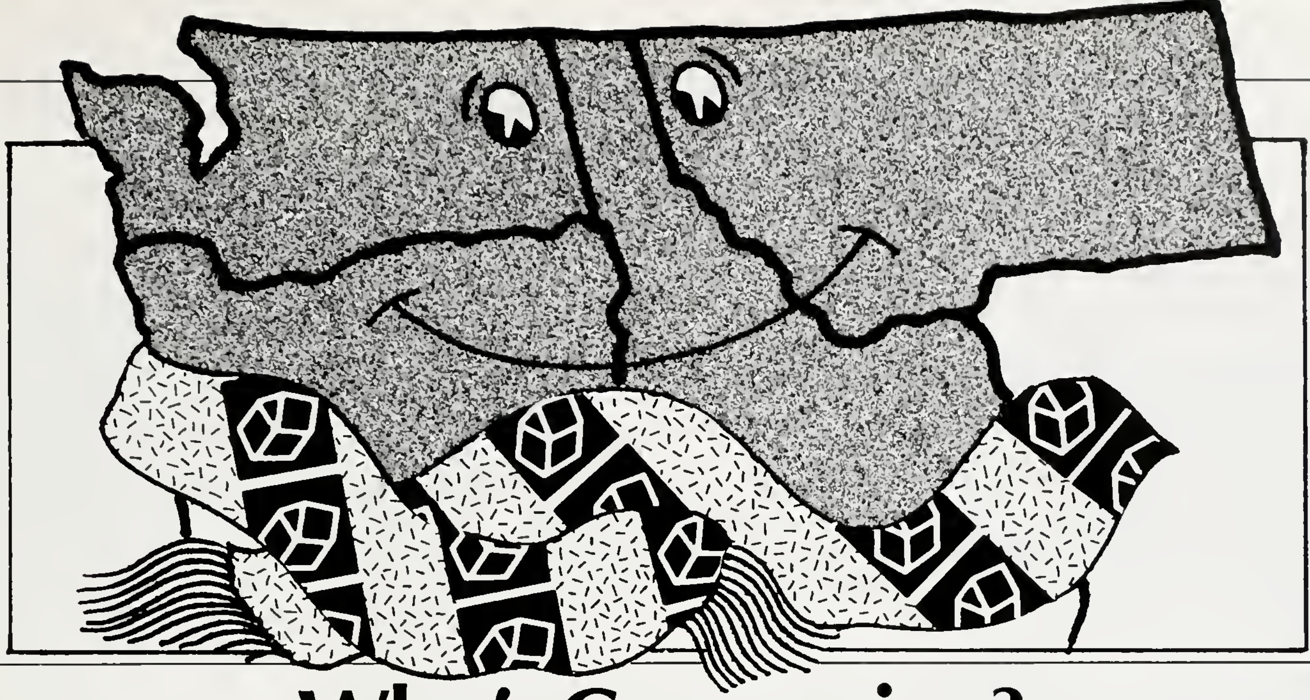
Financing Conservation

Bonneville offers funds for the utilities to award to builders or home buyers to defray the costs of materials and equipment needed to increase energy-efficiency levels in buildings. Some utilities match the Bonneville incentives with their own funds. Some offer their incentives in the form of loans. The Columbia River Public Utility District in northwestern Oregon offered $1,000 credit on a Super Good Cents customer's utility bill. While it has discontinued that practice, it still offers both an additional $1,000 construction payment and a $1,000 credit toward a line extension fee if construction of the new home requires a new power line. Emerald Public Utility District in central Oregon also offers a $1,000 construction payment to match the Bonneville payment.

Chelan County offers a 10-year loan at zero percent interest to help pay for the cost of energy-efficient equipment installed in Super Good Cents homes. Kootenai Electric Cooperative in northern Idaho is working with the local building contractors' association to feature only Super Good Cents homes in their 1988 home show. To entice builders to participate, Kootenai will donate the electric heating system and an energy-efficient water heater for each home. The utility has also agreed to waive its $95 new-connection fee.

The above examples represent just a smattering of the creative efforts some utilities are taking to make the Super Good Cents program a success. Snohomish County in Washington and the City of Ashland, Oregon, have been featured in past issues of Northwest Energy News for their aggressive marketing of the program.

While each utility has developed its own promotional formula, the successful programs share one common denominator — enthusiasm. According to Carol Perigo, Bonneville's Super Good Cents representative for the Lower Columbia area, attitude may equal advertising in determining success. Praising Ashland's energy conservation coordinator Dick Wanderscheid for his positive approach, she said, "Sometimes it's how you look at a problem. It can be either an opportunity or a brick wall. If a negative comes up, Dick will try to turn it around to a positive for the program. He'll say, 'How can we do this?' If we could get others to adopt that positive attitude, we'd have more success." ■



Who's Conserving? Virtually Everyone!

A combination of incentives, strong marketing programs and simple pragmatism has carried the Pacific Northwest over its first hurdle in achieving regionwide electrical energy efficiency in new construction. In one way or another, virtually every utility or local jurisdiction has taken at least the first steps toward meeting building standards that could save the region as much as 1,200 megawatts—the equivalent of two nuclear plants or three coal plants.

Energy saved through efficient new construction is one of the most cost-effective sources of new electrical power. For about half the cost of energy from new coal plants, the Northwest Power Planning Council's model conservation standards will deliver economical electricity to the region and simultaneously save new home buyers roughly half of their electricity use.

To achieve regionwide acceptance of the conservation standards, the Council encouraged the Bonneville Power Administration to offer marketing programs, builder and building-code official training, assistance to local governments wishing to incorporate the model conservation standards into building codes, and technical advice to utilities and local governments attempting to achieve the savings of the model standards in alternative ways. If those inducements failed to move the region closer to more efficient use of electricity, Bonneville could levy a surcharge on those utilities which were not participating in the conservation effort.

As of January 1, 1988, virtually every community or utility had submitted a plan to Bonneville outlining ways it intended to conserve electricity at the level called for by the Council. More than 30 cities and counties had become "early adopters," by rewriting the local building codes to reflect the increased savings available through the standards. More than 100 utilities had signed up for Bonneville's marketing program, Super Good Cents, to encourage new construction that meets the standards. In addition to the residential sector, approximately 80 percent of all new commercial buildings in the Northwest will meet the Council's energy standards. In dollars and cents, these savings could total up to about $620 million that would otherwise have to be spent building power plants.

Already, the "Northwest Energy Code" has attracted the attention of the rest of the nation. Nowhere else is there such multi-state concurrence on the need to make the most efficient use of the region's shared electrical resources.

SHORTS

Federal funds for Columbia River fish screens and other fish passage improvements at major dams survived budget cutting efforts in the nation's capital. Northwest Senators Mark Hatfield (Oregon), Dan Evans (Washington) and James McClure (Idaho) worked to secure the appropriations. The Northwest House delegation also backed the bypass improvements package. The Northwest Senators had earlier pushed to increase the funding for the Columbia River projects from the $2.1 million proposed by the administration to $10.8 million. The larger budget will mean that the projects can be completed on the schedule agreed to by a consensus among the Northwest Power Planning Council, the Bonneville Power Administration, the Pacific Northwest Utilities Conference Committee, the Public Power Council, the Columbia River Inter-Tribal Fish Commission and the Columbia Basin Fish and Wildlife Authority.

The U.S. Congress has approved a bill requiring the Department of Housing and Urban Development (HUD) to develop national energy conserving construction standards for manufactured housing. Members of the Northwest congressional delegation worked hard for this bill's passage in part because 9,000-10,000 new, manufactured homes are located in the Northwest each year. These homes constitute about 30 percent of all new housing starts in the region. The Northwest Power Planning Council had defended new HUD standards because they benefit both the owners of new manufactured homes and the region's entire power system. The bill was also supported by the American Public Power Association, the National Association of Home Builders and the American Association of Retired Persons.

Guaranteed access to the sun is the goal of a uniform solar access building code that may eventually be adopted by 21 local governments in the Portland, Oregon, and Vancouver, Washington, area. The new code, currently being tested in 12 of the 21 communities, has been developed by a unique coalition including five counties, two states and 15 cities. Known as the Metro Area Solar Access Project, the coalition is funded by the Bonneville Power Administration. "Studies show that houses which are sited to receive the sun's rays in the winter will use less energy over their lifetime than homes whose south walls are shaded," states an article in the project's newsletter. More than 20 governments in the Pacific Northwest have already adopted solar access codes as a means of conserving energy. (For more information: *Sunlines*, the newsletter published by the Metro Area Solar Access Project is available from, Conservation Management Services, Inc., 1130 S.W. Morrison, Suite 328, Portland, Oregon 97205.)

Employment growth in the Pacific Northwest exceeded national employment growth during 1986 and 1987, says a report on the economy and regional electrical loads, prepared by the Northwest Power Planning Council. The report also notes that commercial use of electricity in the region has been growing by about 3.2 percent per year since 1979, while Northwest electrical use in all sectors combined has declined slightly during the same period. (Copies of the report are available from the Northwest Power Planning Council. See the back cover of this issue for ordering information.)

Illustration by Reed Darmon

The solar power of polar bears betters the best sunlight collectors, say researchers studying the fat and furry creatures. Polar bear fur, contrary to appearances, is clear like optical fibers. Underneath, the skin itself is black. The fur seems to function much like the glazing on a solar collector, with the black skin absorbing the heat. But polar bears are 95-percent efficient, compared with the best and most expensive solar collectors, which are rarely even 65-percent efficient. The fur also appears to permit only ultraviolet light to penetrate to the skin, a feature that enables the bear to collect solar heat even on cloudy days because ultraviolet light passes through clouds. When "polar-solar" collector panels, designed to mimic the optical qualities of the fur, were tested on rooftops, collection efficiency was increased by 50 percent. (Source: Christian Science Monitor story, carried in *The Seattle Times*, December 7, 1987.)

SHORTS

Non-profit agencies may save 10 to 15 percent of their energy costs thanks to a pilot project in Clark and Skamania Counties in Washington. The project, sponsored by the Bonneville Power Administration, will offer free energy management advice to the 15 to 25 organizations selected to participate. No-cost and low-cost energy saving measures will be stressed along with energy audits of agency buildings. Free training seminars will help participants learn how to monitor their ongoing energy use and the savings garnered through the conservation improvements. (For more information: Contact Claudia Fisher, Intergovernmental Resource Center, Box 5000, 1013 Franklin Street, Vancouver, Washington 98668, 206-699-2361.)

The U.S. Bureau of Reclamation has announced plans to change its mission from one of developing water resources to one of conserving them. After more than 85 years in the business of dam building and irrigating deserts for agricultural purposes, the Bureau has concluded that its mission in those areas has been accomplished. Its new mission will include making existing Bureau projects—some of the largest dams and most complex irrigation systems in the world—more efficient and more responsive to environmental concerns. The Bureau may also apply its engineering capabilities to looming problems such as the depletion of groundwater and the build-up of silt and toxic wastes in Bureau projects. (Source: *New York Times,* Sunday, November 8, 1987.)

Global energy use can be cut in half and economic growth encouraged by using existing energy-efficient technologies, suggests a report published by the World Resources Institute. Developing countries could achieve the living standard equivalent to 1970s Western Europe with only a 30-percent increase in per capita energy consumption, the report also noted. The authors, energy experts from Brazil, Sweden, India and the United States, emphasize four areas they consider technologically promising: space heating, appliances, automobiles and steelmaking. They list super-insulated homes, energy-efficient refrigerators and light bulbs, cars that can get 98 miles to the gallon and steelmaking processes that halve energy requirements. (Copies of the report, "Energy for a Sustainable World," and a companion piece, "Energy for Development," are available for $10 plus $2 postage each from World Resources Institute Publications, Box 620, Holmes, Pennsylvania 19043.)

Between 7,000 and 2,000 years ago, Columbia River salmon runs declined so much that basin Indian tribes had to rely on other fish, mammals and plants, says Oregon State University anthropologist Patrick Thomason in his recently completed master's thesis. His studies of bone remains and other artifacts from the banks of the Columbia led to his conclusion that climatic changes may have led to a 5,000 year collapse of the fishery. The huge runs seen by early explorers to the region signify the recovery from that ancient destruction. (Source: *Sea Pen,* the bimonthly newsletter of the Oregon Sea Grant Program, Administrative Services 422, Corvallis, Oregon 97331.)

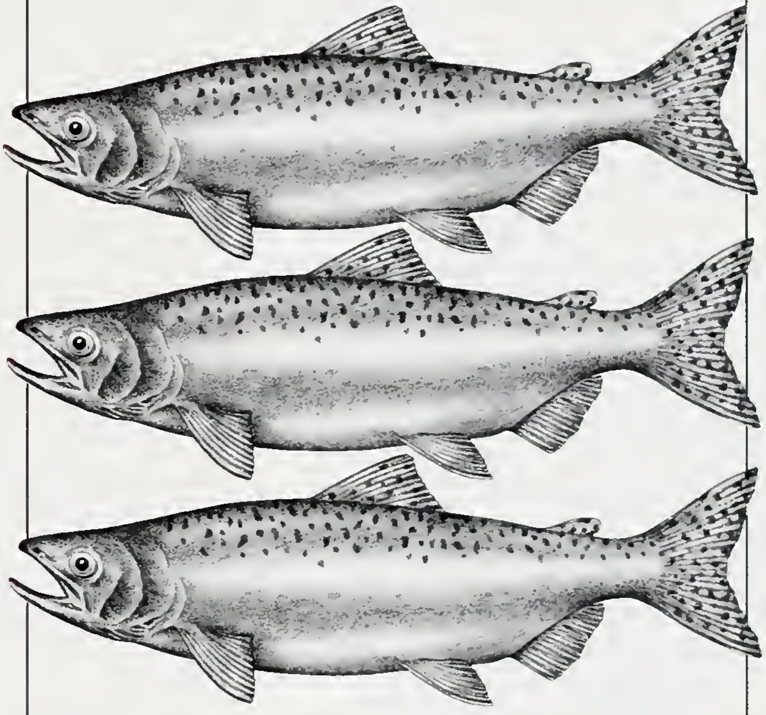


Illustration by Joan Barbour

The Oregon Department of Fish and Wildlife is calling 1987 "The year of the chinook," because of record ocean and inriver harvests of the prized fish. In addition, the runs featured larger-than-average fish, some weighing more than 60 pounds. The department credits a mix of factors for the successful returns. Reduced harvests in Alaska and Canada due to the U.S./Canada Pacific Salmon Treaty; improved smolt passage down the Columbia because of Columbia River Basin Fish and Wildlife Program measures; improvements in hatchery productivity; and improved ocean survival were all praised as contributing to the year's successes. The Department also predicts the good news to continue through next year's chinook runs and harvests.

Brighter Lights and Smarter Switches

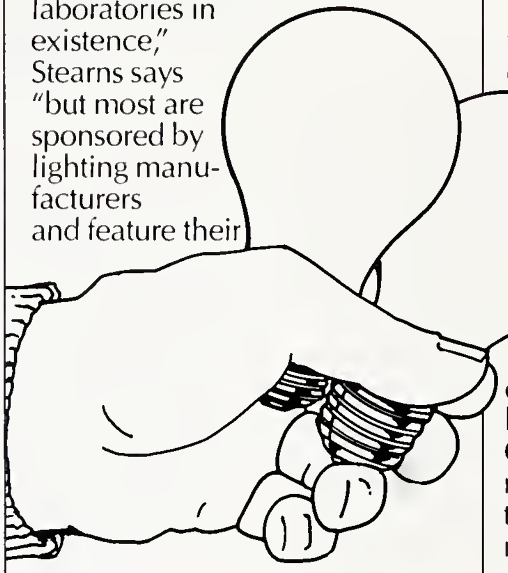
Imagine a facility at which an architect can have mock-up rooms constructed to test various types of lighting before a lighting system is actually installed in a building. Or picture a place that lets designers demonstrate state-of-the-art equipment to help their clients avoid taking huge financial risks. That is exactly what Seattle City Light, the Northwest Conservation Act Coalition, the Natural Resources Defense Council and the Bonneville Power Administration are thinking of building in Seattle.

These organizations are convinced that actually looking at and experimenting with new equipment and various lighting strategies in a realistic design situation is the most effective way for a lighting designer to become familiar with energy-efficient systems.

"Energy efficiency in lighting is extremely important," explains Margie Gardner, conservation analyst with the Northwest Power Planning Council. "The lighting of buildings currently uses about one-third of the electricity consumed in the commercial sector. As that sector uses 20 percent of the electricity sold in the Northwest, lighting is a significant user of electricity."

Tim Stearns, policy coordinator with the coalition, hopes this "lighting laboratory" will improve both the energy efficiency of lighting and the design of lighting systems used in new buildings.

"There are other lighting laboratories in existence," Stearns says "but most are sponsored by lighting manufacturers and feature their products. This laboratory will allow people to compare fixtures from many companies and to learn about energy efficiency, something other labs do not focus on."



"This facility will consist of several parts," according to Diana Campbell, Seattle City Light's project manager. "The 6,000-square-foot facility will house a resource library, lighting displays and, most importantly, a mock-up space, able to accommodate an unlimited number of different strategies in efficient lighting. The displays will be vignettes showing the most efficient products in work areas such as retail space, conference rooms and restrooms. In addition, there will be resource people and computers to help design lighting systems."

"Lighting technologies have changed phenomenally in the last few years" says the Council's Gardner. "Inefficient lighting requires large amounts of electricity to produce light, it also radiates heat. This causes air-conditioning systems to work overtime. Both electricity and money are wasted. Hence there has been a great deal of incen-

Keeping Commercial Conservation Current

When the Northwest Power Planning Council first developed its model conservation standards for commercial buildings — setting energy-efficiency levels for restaurants, offices and other buildings — the standards were as stringent as any in America. Now, new technologies and new codes are passing the Council's commercial standards by. As a result, the Council is currently reviewing its standards and may revise them.

Four papers on issues related to this potential revision are being distributed for public review this fall and winter. Based on the analysis and comment received on these papers, the Council intends to release a draft rule on the model standards for new non-residential buildings this spring. A decision on the revision is scheduled for midsummer.

The Council adopted model conservation standards for new commercial buildings as part of its 1983 Power Plan. These standards were based on the Council of American Building Officials' model energy code, which had as a technical basis the American Society of Heating, Refrigerating and Air-conditioning Engineers' (ASHRAE) Standard 90A-1980, Energy Conservation in New Building Design. This is a national consensus standard that serves as a model for energy codes in the majority of states.

The Council modified two sections of the code covering lighting and ventilation. The lighting provisions were modified to be consistent with what was then Seattle's lighting code — the most stringent in the Northwest at the time. ASHRAE's more recent ventilation standards were used in the model conservation standards to ensure acceptable indoor air quality.

Portions of the commercial standards have been modified since 1983. Now, the entire commercial model conservation standards are being reviewed. Tom Eckman, conservation analyst with the Council, says the review was prompted by the fact that building practices and techniques have advanced, making several energy-efficiency features even more economical. In addition, other codes are appearing in the Northwest that are tighter than the Council's model standards.

Since the Council first adopted its model standards in 1983, Oregon and Washington have revised their energy codes, and Seattle adopted a new, more stringent code for non-residential buildings. ASHRAE also is in the final stages of updating it's energy conservation standards. In addition, the U.S. Department of Energy recently proposed energy conservation standards for new, government-owned, non-residential buildings. These will serve as voluntary guidelines for other commercial buildings and parallel ASHRAE's new standard. All of these codes contain more stringent provisions than the Council's standards.

Currently, the Council's strategy to achieve energy-efficient commercial buildings consists of two elements. The first is the adoption of more energy-efficient building codes. But Eckman notes that "because there is so much diversity in commercial buildings, it is not possible to identify all regionally cost-effective conservation measures in a single set of building standards." So, the second element of the Council's strategy is to have utilities offer programs that help identify more efficient designs. The Bonneville Power Administration, through its "Energy Smart" design assistance program, encourages architects, designers and builders to construct buildings that are at least 10 percent more efficient than the Council's current model standards require. One part of the program, called "Energy Edge," offers incentives to build to 30 percent beyond the level of the standards.

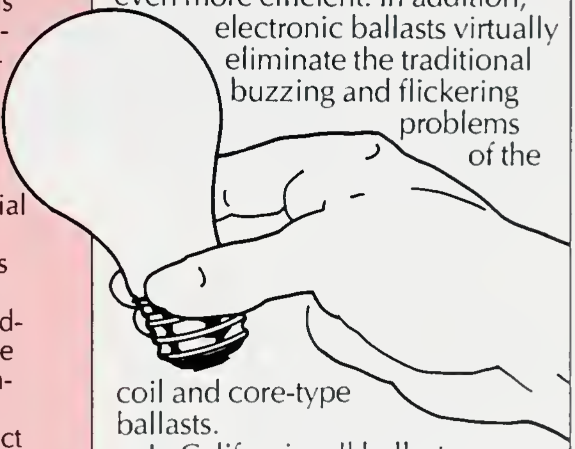
The Council, in its commercial standards review process, is looking at these programs to see how well they are working and if other programs or policy options should be developed. Please contact the Council's public involvement division to receive further information on the review process.

RLC

tive to make lighting technologies more efficient, and the Northwest can now reap the benefits of these changes."

Innovations have occurred in the most common type of lighting fixture used in homes — the traditional incandescent light bulb, which uses electricity to heat a tungsten filament until it glows. New types of these lights are appearing that represent significant energy savings.

Fluorescent lights are often recommended for commercial buildings, because they use about a quarter of the electricity of incandescent bulbs and last 20 times longer. Fluorescent lights consist of the lamp tube, the fixture and the ballast, which is located at the base of the tube and regulates the electric current that passes through the tube. Ballasts have changed significantly in recent years. Conventional ballasts work through magnetic forces and are made of an aluminum coil wound around an iron core. More efficient ballasts are now made with higher grade iron or steel at the core and copper windings instead of aluminum. Just appearing on the market are electronic ballasts, which are even more efficient. In addition, electronic ballasts virtually eliminate the traditional buzzing and flickering problems of the coil and core-type ballasts.



In California, all ballasts manufactured after 1983 must meet a minimum-efficiency rating. This standard ensures that only better quality ballasts are produced and limits retail and wholesale ballast sales to only those that comply with the standard. This is one method of ensuring that energy is used efficiently.

Also very efficient are high-intensity discharge lights that work like fluorescent ones but contain different gasses. The three major types — mercury vapor, metal halide and high-pressure sodium — have traditionally been used for outdoor lighting because they change colors (as compared to common incandescent lighting). However, they are being used indoors now for special applications where color is not a major concern.

The number of hours a light operates significantly influences the amount of electricity used. No matter how efficient a lighting design, electricity is wasted if the lights are used when they are not needed. Therefore, "lighting control strategies" are also being implemented.

One of the most common controls is the on/off light switch placed in each room of an office building. This seemingly obvious "strategy" is now required in most building codes. However, before the oil crisis in the 1970s, the lights on entire floors of commercial buildings were switched on by only one or two wall switches. This meant that if only one person were working late, all the lights were operating. The science of lighting controls has advanced considerably since those days. Now controls are available that turn lights off when there is daylight in the area or when people leave a room.

"The goal in lighting new energy-efficient buildings is to produce an effective, pleasing and satisfying working environment with minimal electricity consumption," says Gardner. "Both the quality and quantity of lighting are important aspects of good lighting design."

In the Council's model conservation standards (which set energy-efficiency levels for new buildings) a lighting "budget" is laid out. The budget lists power allowances for different building types, such as office buildings, retail stores, warehouses, restaurants or schools. For example, the office building allowance is 1.5 watts of power per square foot. Work areas that need lots of light may exceed this allowance, while areas such as hallways may require less. The overall facility complies with the code if it averages out to less than or equal to 1.5 watts per square foot. This method is used in many other codes such as the Oregon and Washington state codes.

But the changes that have occurred in lighting technology may mean that the Council's standards no longer reflect the level of energy efficiency possible in the lighting systems of commercial buildings. This is being considered as the Council evaluates potential changes to the lighting budgets in the current model conservation standards for commercial buildings. The accompanying box on the commercial model standards describes this ongoing evaluation.

In the meantime, Seattle City Light is planning to go ahead with the lighting laboratory, a resource the utility hopes will open next winter to serve the whole Northwest.

CELEBRATING THE FOURTH

Illustration by Reed Darmon

by Carlotta Collette

For virtually all of its history, the city of Tacoma, Washington, has had to contend with taking second place behind Seattle. Like Gary, Indiana, to Chicago, Tacoma was the workhorse, while Seattle pranced ahead of it. But in 1983, Tacoma demonstrated its foresight and took the lead by becoming the first city in the Pacific Northwest to adopt as building codes the Northwest Power Planning Council's model conservation standards (MCS) for new electrically heated buildings. (Seattle adopted comparable codes in 1987.)

Tacoma took its giant step toward energy efficiency at a time when the Northwest had not even developed support programs to encourage such participation. There was little technical assistance and none of the financial incentives that now ease community acceptance of the rigorous conservation standards.

Four years later, the city's Mayor Doug Sutherland, proudly proclaims that his jurisdiction has produced over 6,000 new living units, 150 new commercial buildings, and nearly 500 additions and remodels that all meet the super-conserving standards. In fact, Tacoma's conservation effort has netted the city more new and remodeled energy-conserving buildings than the rest of the region combined!

"We estimate that for every year we implement the MCS, we save one average megawatt," notes the mayor. "During 1987, we saved three average megawatts."

Undaunted by its reputation as an also-ran, Tacoma has built on its solid industrial base and multi-billion dollar military presence. The Port of Tacoma is considered one of the five best natural harbors in the world. It now also ranks among the fastest growing ports in the nation, with the city expanding its role as an international shipping center focusing particularly on Pacific Rim trade.

Electrical loads have followed the city's growth. Power needs for the city-owned utility, Tacoma City Light, expand between 1 and 2 percent per year, and finding energy resources to meet that load is becoming a challenge. "Our MCS program is obviously making a dent in what our load growth would otherwise be," said Energy Conservation Manager Jacob Fey, during his report on the city's success at the Council's November meeting in Tacoma.

Fey explained that Tacoma is now looking to the rest of the region to catch up with the conservation leaders. "To achieve the MCS regionwide within the next five to 10 years requires a commitment and a long-term strategy on the part of Bonneville, the Power Council and the region's utilities," he said. "The citizens of the Northwest deserve it," the mayor adds.

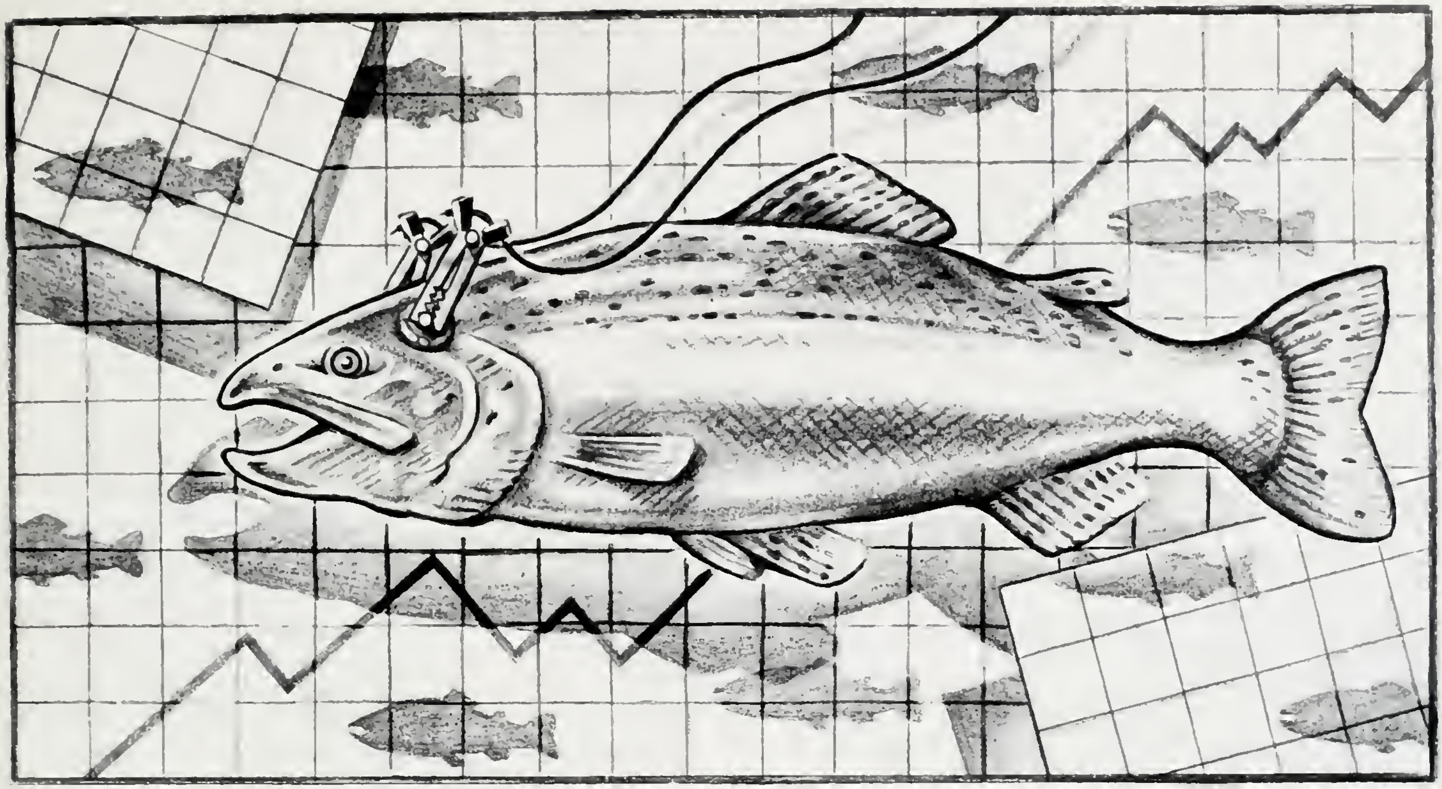


Illustration by Reed Darmon

THE FEEDBACK FACTOR

by Beth Heinrich

Monitoring and evaluation. What could be more dry? The combination is one surefire way to put any audience to sleep. But before you doze off, consider this. You are a racehorse fan and the thrill of the track has you betting on your favorites. If they continue to cross the line first, you'll continue to bet on them. But if, in your meticulous review of each day's race results, you find a favorite horse coming up short, you're apt to stop betting on him. Instead, you place your money on a horse with a more promising track record.

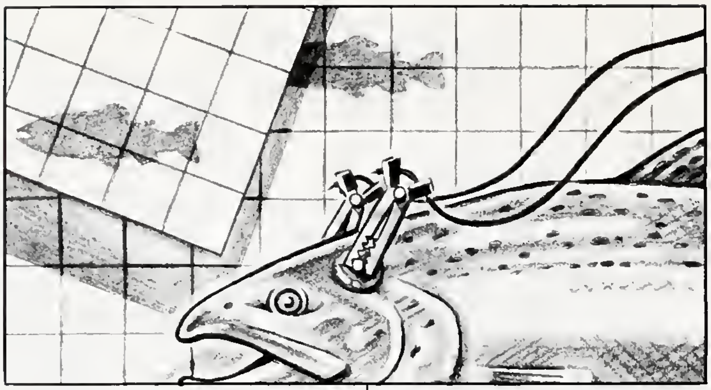
Whether you realize it or not, you've just conducted your own monitoring and evaluation program. You monitored the races, evaluated a particular horse's performance, and then made the necessary changes to spend your money more wisely. The new horse may not be a sure bet, but according to your research, he's your best bet.

The Northwest Power Planning Council doesn't deal in horses, but the fish business can be just as risky, especially when you're betting with someone else's money. That's why the members of a technical work group, including the Council's Chip McConnaha, are spending hours designing a monitoring and evaluation program for the Council's Columbia River Basin Fish and Wildlife Program.

The monitoring and evaluation group is focusing its attention on the new, regionwide thrust to double the basin's salmon and steelhead runs. Its members — all experts in the technical numbers game — have been working since last April trying to devise a program that will measure progress made toward that doubling goal.

It is no secret that some projects to increase fish numbers are a calculated gamble. "The Council's fish and wildlife program represents a sizeable investment on the part of the region's electrical ratepayers," explains McConnaha. "In some instances, investments in projects are being made without knowing what the real benefits will be. That's where the monitoring and evaluation program comes in. By keeping close tabs on individual projects, as well as progress toward the doubling goal, we'll be able to know what does and doesn't work."

In addition to assessing and accounting for changes in the salmon and steelhead run sizes, the monitoring and evaluation program will ensure that efforts to increase fish production will be consistent with several policies the Council spelled out last February, when it adopted the interim doubling goal.



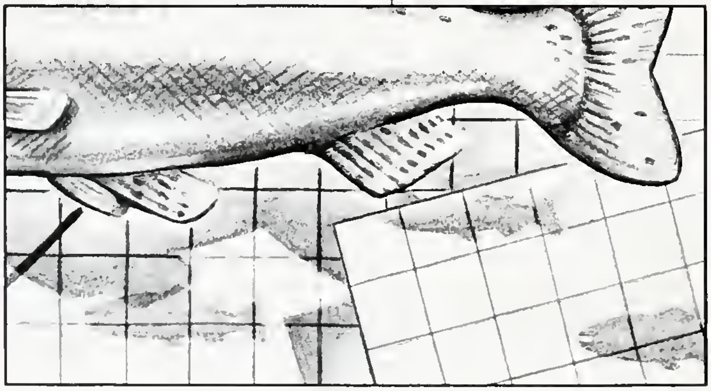
The information will also supplement the Council's annual reports to Congress.

McConnaha points out that an effective monitoring program is necessary not only to justify expenditures, but to provide the valuable feedback and information that will help guide future investments. "Any information the monitoring and evaluation program provides will give us some insight into the effectiveness of the fish and wildlife program and should result in better, more informed judgments in the future."

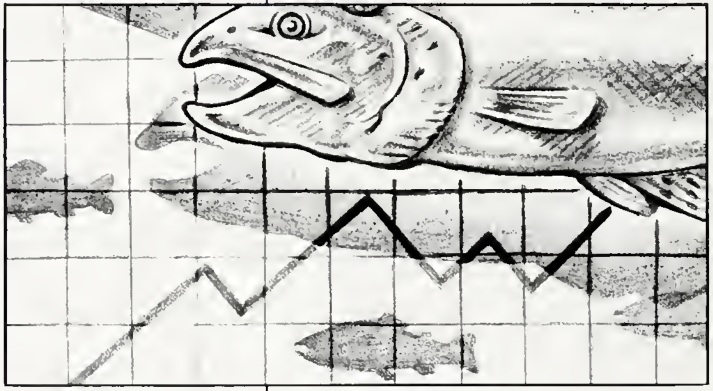
But measuring the effectiveness of the fish and wildlife program isn't as straightforward as one might think. The tendency is to simply count the returning adult salmon and steelhead each year. If the numbers are increasing, then the fish and wildlife program is working. Right? Not necessarily!

The fact is that mitigation efforts under the fish and wildlife program are only part of the whole picture. The annual abundance of adult fish, or "total adult production," is also influenced by harvest, water conditions, the number of fish produced during up to four brood years, and a host of other things outside the scope of the Council's program. In other words, the number of returning salmon and steelhead alone is not a good indicator of program success.

Recognizing this, the work group, in addition to looking at total production, has been discussing the use of a measure of productivity that might be called the "equilibrium production potential." The group contends that while the fish and wildlife program refers to the doubling goal in terms of total adult production or *numbers* of fish, an alternative approach to that goal is to double the *productivity* or production capacity of the system. According to McConnaha, productivity refers to the system's ability to *efficiently* produce adult fish and could be measured, for example, as the total number of adults produced from a given number of spawners or given habitat.



Sound complicated? It is. But despite the technical jargon, monitoring and evaluation are essential elements of any effective and efficient program. Without them, managers could end up dumping money into worthless projects, never realizing their mistakes, let alone learning from them.



Fisheries management is an art, not an exact science. It is chock-full of unknowns, especially in a system as complex as the Columbia River Basin. It only makes good sense to incorporate the necessary checks and balances so resource managers and planners can identify unproductive efforts and make the appropriate changes. Identifying the successes becomes just as important as identifying the failures, however, because projects that are proving to be wise investments are likely to be good bets in the future.

The key is to learn from a monitoring program and transfer that knowledge and experience into the field, where it counts. No one will argue that the stakes are high and the risks are great, but with a good, solid monitoring program in place, the odds are in our favor.

CALENDAR

January 30 — Aquaculture conference at the Tyee Motor Inn in Olympia/Tumwater, Washington. Sponsored by the Washington Department of Agriculture and Washington Governor Booth Gardner. For more information: John Pitts, Washington Department of Agriculture, 206-586-2777.

February 10-11 — Northwest Power Planning Council meeting at the Madison Hotel, 515 Madison Street, Seattle, Washington.

February 17-19 — The "15th Annual Energy Technology Conference and Exposition" in Washington, D.C. Sponsored by the American Gas Association, the Electric Power Research Institute, the Gas Research Institute and the National Coal Association. For more information: Energy Technology Conference, Inc., 966 Hungerford Drive, Number 24, Rockville, Maryland 20850, 301-251-9250.

February 25-26 — "Lighting Management" seminar in Los Angeles, California. Sponsored by the Association of Energy Engineers. For more information: Association of Energy Engineers, 4025 Pleasantdale Road, Suite 420, Atlanta, Georgia 30340, 404-447-5083.

March 9-10 — Northwest Power Planning Council meeting at the Canyon Springs Inn, Twin Falls, Idaho.

April 10-14 — The "Solar Energy Conference" in Denver, Colorado. Sponsored by the American Society of Mechanical Engineers. For more information: ASME Meetings Department, 345 E. 47th Street, New York, New York 10017, 212-705-7793.

April 16-20 — The "Frontiers of Public Service" national conference in Portland, Oregon. Sponsored by the American Society for Public Administration. For more information: ASPA, 1120 G. Street, N.W., Suite 500, Washington, D.C. 20005, 202-393-7878.

June 27-July 1, 1988 — "International Symposium and Educational Workshop on Fish-marking Techniques" at the University of Washington in Seattle. Sponsored by the American Fisheries Society and the U.S. Fish and Wildlife Service. For more information: Dr. Nick C. Parker, Marking Symposium, U.S. Fish and Wildlife Service, Route 3, Box 86, Marion, Alabama 36756, 205-683-6175.

A more detailed calendar of Council committee meetings and consultations is carried each month in Update! See order form on back cover.

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The Northwest Power Planning Council is required to develop a program to restore the Columbia fisheries and a regional electric energy plan, to be carried out by the Bonneville Power Administration, emphasizing cost-effective conservation and renewable resources.

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- ☐ 1987 Columbia River Basin Fish and Wildlife Program
- ☐ 1986 Northwest Power Plan
- ☐ 1987 Northwest Power Planning Council Annual Report
- ☐ Issue Paper on Protected Areas Designation
- ☐ Status Report on the Regional Economy and Loads
- ☐ Heating New Homes: A Comparison of the Cost of Heating with Electric, Natural Gas and Fuel Oil Heating Systems (Final Report)
- ☐ Western Electricity Study briefing papers
- ☐ Briefing Paper: Western System Overview
- ☐ Briefing Paper: Electricity Use in the Western U.S. and Canada
- ☐ Briefing Paper: Interregional Transactions
- ☐ Draft Briefing Paper: Existing Generating Resources in the West
- ☐ Draft Briefing Paper: Future Resources
- ☐ Staff Briefing Paper on Commercial Lighting

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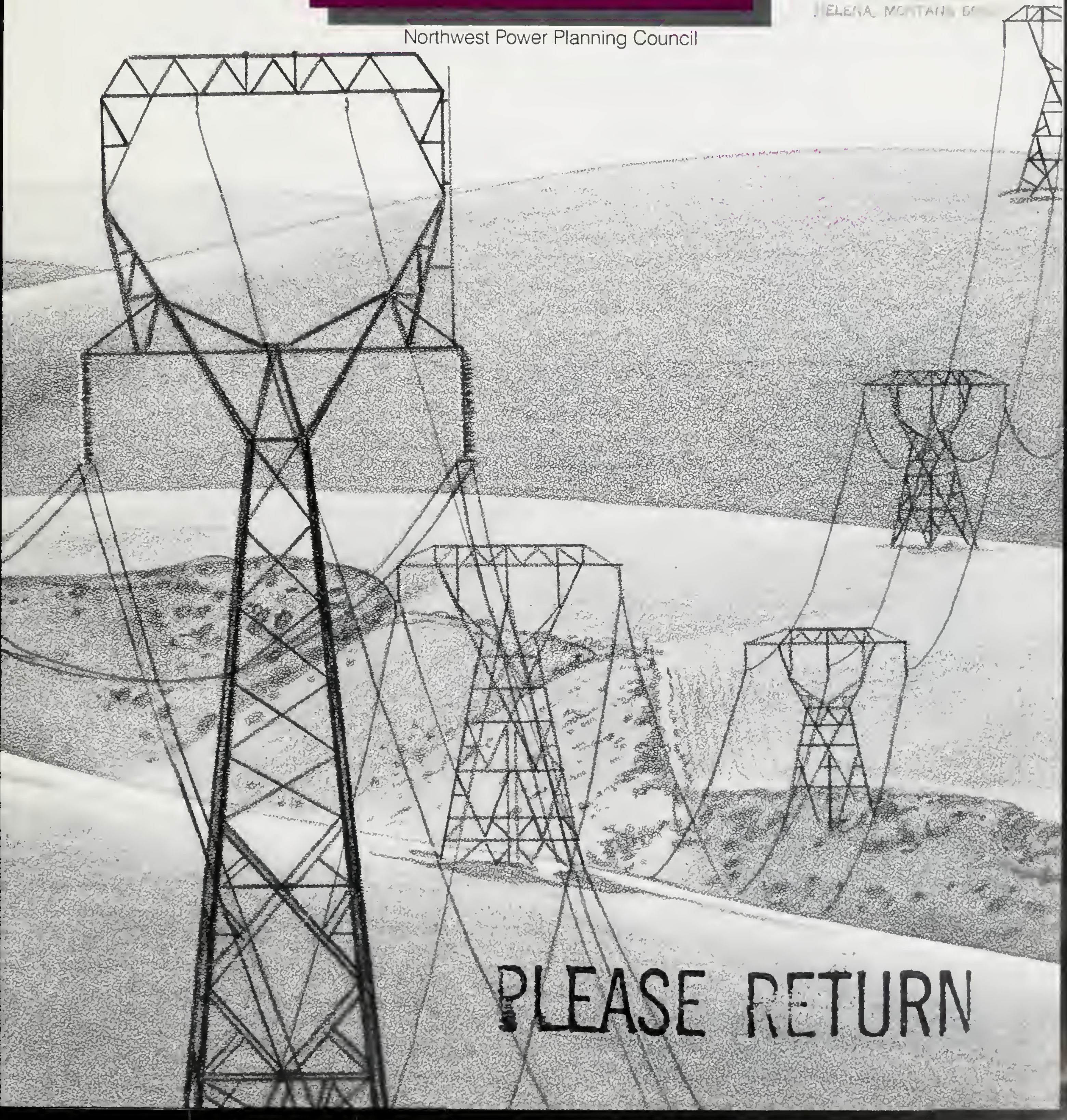

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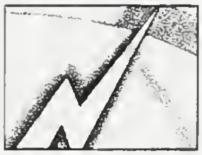

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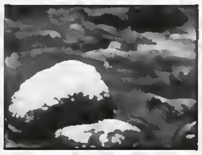

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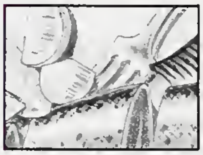

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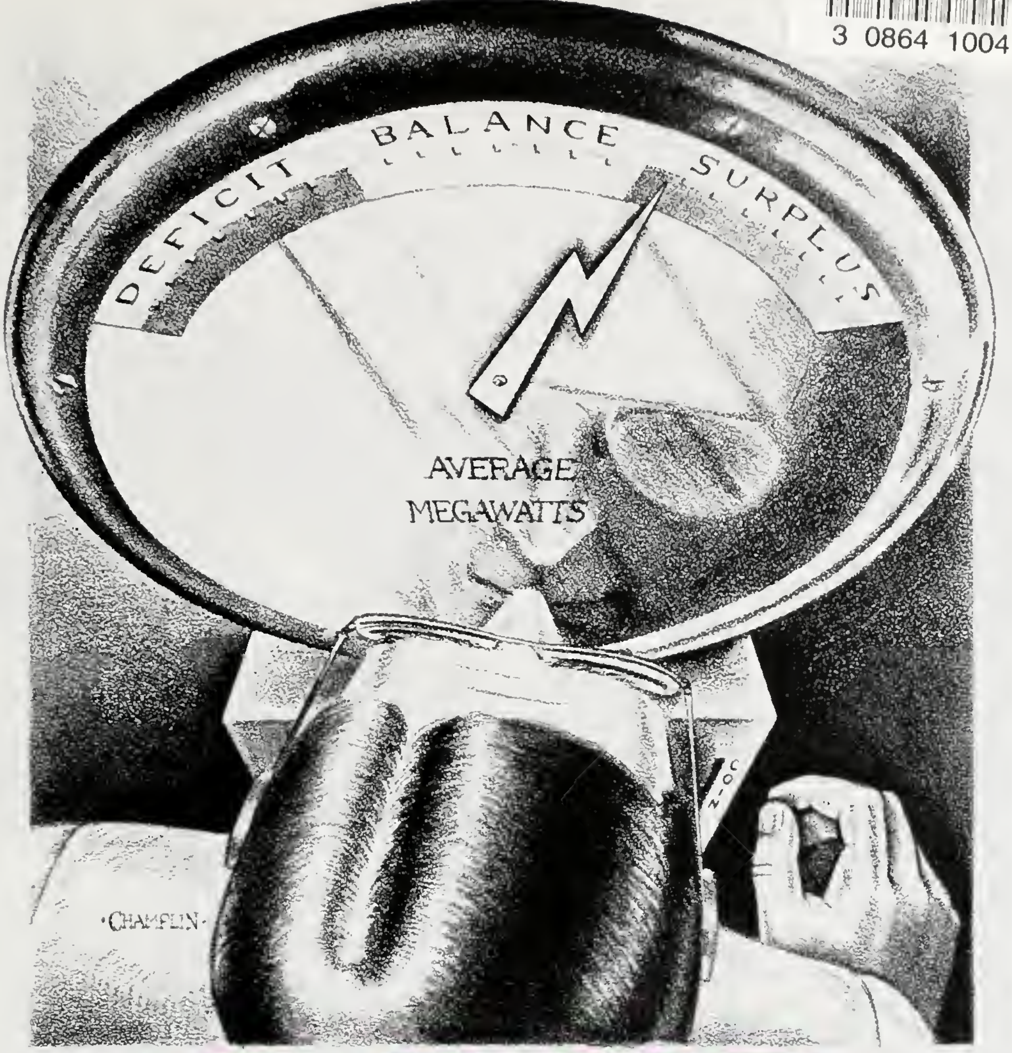


Illustration by Dale Champlin

SIZING THE SURPLUS

That the Northwest has an electrical energy surplus is not news. The region has had excess electricity since 1937, when the first federal dam started operating.

by Ruth L. Curtis

Eelectrical energy consumers may have come to regard the current surplus as a kind of security blanket, forgetting that less than a decade ago energy experts were predicting power brown-outs that could curtail the Northwest's economy. In fear of that future, some utility planners rushed to build huge expensive electrical generating plants. Much of the current surplus is composed of power from these plants, power that is very expensive, due to the high costs of building and operating the plants.

Now it appears that the region's expensive security blanket of power is shrinking, and already some voices are beginning to call for new plant construction. "The lesson to be remembered is that balancing power supply with power demand is a delicate process," explains Ed Sheets, executive director of the Northwest Power Planning Council. "While there is a danger of building too few resources, there is also a high cost associated with building too many resources. To keep electricity costs as low as possible, the region must avoid both large surpluses and shortages," he adds.

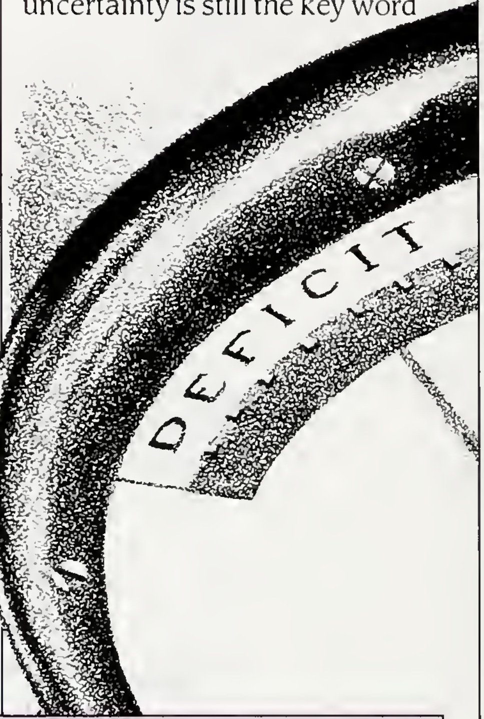
The balance between supply and demand for electricity is dynamic, moving with changes in fuel costs, new technologies, economic conditions, current electric rates and even the weather. Just how large the surplus is and how long it will last are critical factors in planning to meet the electrical needs of the region.

The Council examined the power surplus this winter and found that it has indeed decreased since it was last analyzed as part of the 1986 Power Plan. But this shrinking was anticipated in the plan. The current projection of the regional surplus has been refined, based on new information published since the power plan. For the 1988 operating year, the region's firm surplus ranges from a low of about 1,000 average megawatts to a high of 1,750. The midpoint falls at about 1,400 average megawatts (including firm, long-term export sales). By way of comparison, a city the size of Seattle uses about 1,000 megawatts.

In the 1986 Power Plan, the surplus was approximately 2,500 average megawatts excluding firm export sales. (It would likely have been 2,100 with export sales.) The 1986 forecast suggested that by 1988 the surplus could drop approximately 1,000 average megawatts. In other words, the surplus is declining on schedule.

Key reasons for the declining surplus include a pick-up in aluminum production in the Northwest (aluminum smelters use vast quantities of electricity), the emergence of the economy from its slump, and the closing of the Hanford nuclear reactor.

In spite of the apparent predictability of the declining surplus, uncertainty is still the key word



THE KINDS OF SURPLUS

There are three types of surplus electricity that can be produced by the Northwest's power system. They are:

Firm power: The amount of energy produced by the hydropower system can vary substantially from year to year due to weather-related fluctuations in the water supply. For planning purposes, the historically worst sequence of water conditions (critical water) is used to determine the amount of energy that can be guaranteed to be generated by the system. This is called firm power. Currently, the Northwest power system is overbuilt, meaning that it can produce more energy on a guaranteed basis than there is demand for the energy. This excess generation is surplus firm power, created by overbuilding new generating resources.

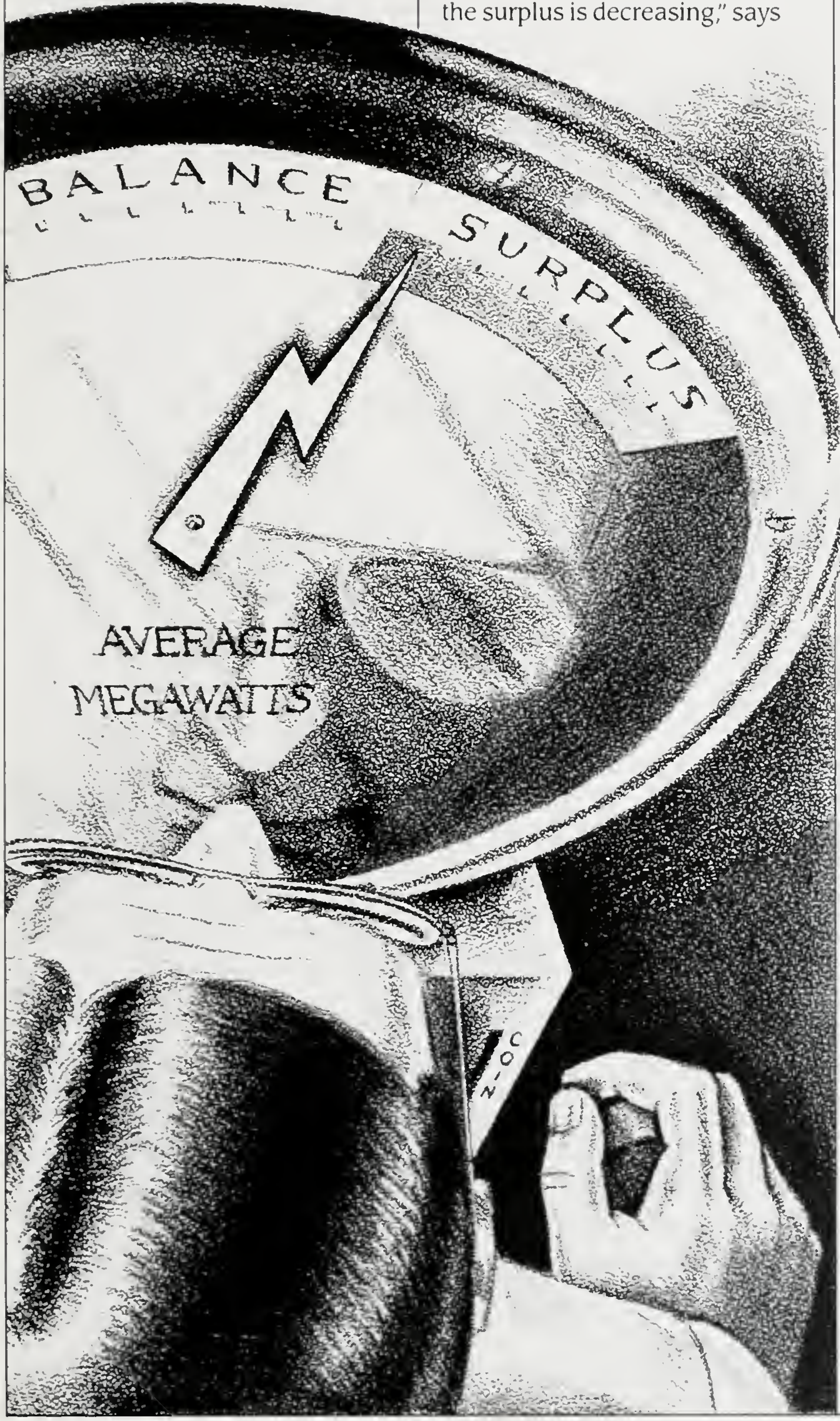
Nonfirm power: In most years, additional energy is generated by the region's dams. This is called nonfirm power because it is dependent on river flows and consequently cannot be guaranteed. Nonfirm power has been marketed primarily to California utilities. Due to the dry conditions this past year and continued lower than average precipitation in the Northwest, there will likely be little available nonfirm power for 1988.

Peaking capacity: Capacity is what is available from the power system at any given time. The Northwest's hydro-dominated system has a peak generating capacity that is relatively high compared to the system's energy generating capability. After taking into account operational constraints and reserve requirements, the Bonneville Power Administration has estimated that approximately 2,000 megawatts of peaking capacity may be available for sale outside the region.

—RLC

for when the surplus will end and the region will need to acquire new resources. If the region experiences high economic growth, with the aluminum plants continuing to operate at full strength, and new industries moving into the region, the surplus could be gone by 1991. However, if the Northwest has hard economic times with low growth, the surplus could last for more than 20 years.

Whenever the surplus ends, the Council's 1986 Power Plan contains actions designed to prepare the region. "Given that the surplus is decreasing," says Sheets, "the Northwest needs to take actions now to ensure that we don't lose low-cost opportunities and that we prepare to acquire conservation and other resources when they are needed."



These measures deal with ensuring that the Northwest is not missing the opportunity to acquire inexpensive resources – such as energy-efficient new buildings – that will be lost if no action is taken. If new buildings are not constructed to be energy-efficient now, they will consume electricity inefficiently long after the current electricity surplus is over. But if they are made energy-efficient now, the Council estimates that, in homes alone, between 130 megawatts and 790 megawatts of electricity can be saved at costs lower than all of the other possible resources available to the Northwest. If these homes are retrofitted with energy-efficient measures after they are built, the cost will be considerably higher.

The Council's plan also aims to ensure that the Northwest has the capability to develop other cost-effective resources, including conservation, renewables and conventional resources, as they are needed. This involves resolving barriers to their development and developing an acquisition process so that the resources will be ready when their power is needed.

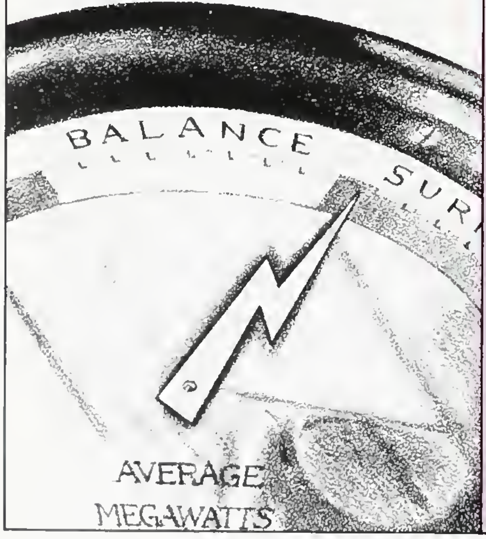
The load and resource situation of the Northwest is being reassessed during this summer's evaluation of the power plan. The accompanying box describes this evaluation process.

The Northwest is not the only region in the West with surplus electricity. Most of the West, except the California/southern Nevada area, has a surplus. In fact, California would not be able to meet its peak summer demands if it did not import power from both the Pacific Northwest and the Desert Southwest.

Since 1980, the Bonneville Power Administration has been successful in marketing some of the Northwest's surplus to California utilities via short-term contracts. Long-term contracted sales that are marketed at higher prices would seem more attractive because of the added revenue they produce, but there are risks. If too many long-term sales are made without provisions to call back the power, and the Northwest were to grow rapidly, the region might be forced to build expensive new generating resources much earlier than anticipated. Electricity rates would rise because even new conservation resources cost five times more than the existing hydropower, while new coal plants cost 11 times more.

"To keep rates down, the region must plan to use its surplus carefully," says Sheets. That is the lesson the Northwest's experience has taught utility planners. That is also the goal of the Council's power plan. Whether it is achieved or not, will be reflected in consumers' electric bills when the surplus does finally end.

> "Given that the surplus is decreasing, the Northwest needs to take actions now."



SUPPLEMENT TO THE 1986 POWER PLAN

The Northwest Power Plan, adopted by the Northwest Power Planning Council in 1983 and updated in 1986, is designed to be a blueprint for a stable, electrical energy future in the Northwest. The plan forecasts regional electric needs and plans for developing appropriate energy resources as they are needed. The goal of this planning effort is to ensure that the Northwest has an adequate and reliable supply of electrical power over the next 20 years at the lowest cost to the region.

Because the future is uncertain and conditions are likely to change, this plan is not a static document. Flexibility is one of the underlying concepts built into the Council's planning strategy, and it has proved to be extremely important.

In the two years since the 1986 plan was adopted, the Pacific Northwest has not been stagnant. Several conditions affecting the region's electrical system have changed. The most spectacular example is the collapse of world oil prices in 1986. More subtle, but equally important, new information has become available on energy savings and construction techniques for energy-efficient homes. As part of an ongoing monitoring program, the effect of several changes has been evaluated and, in some cases, the plan has been amended.

The Council has decided that it is time to evaluate the cumulative effects of all changes that have occurred since the plan was developed. This spring and summer, the Council will conduct a technical analysis that will be the basis for a review of the 1986 Power Plan. The Council's review may suggest possible changes in the implementation process or timing of activities called for by the plan.

As part of this technical analysis, the forecasts of electricity needs will be revised to reflect the most recent data on fuel prices, the region's economy, and the nation's economy.

The amount of energy that conservation can provide to the region will be examined. Additional information is also available on generating resources, such as hydropower, cogeneration, coal and natural gas. All of this information will be included in the analysis.

The target dates for this process are:

- In June, draft issue papers summarizing demand forecasts and the conservation and generating resource analysis will be presented to the Council and distributed for public comment.
- In July, a draft issue paper on the resource portfolio will be released for comment. The Council is expected to begin considering adopting the updated technical analysis. Public comment will be taken on this technical analysis through August.
- In September, after the public comment is reviewed and appropriate changes made in the analysis, a final updated technical analysis will be presented to the Council for its review.
- In October, the Council will make decisions regarding any amendments to the 1986 Power Plan that appear to be needed.

Call the Council's central office in Portland, Oregon to receive the issue papers relating to this process. (Toll-free numbers are listed on the inside back cover of this magazine.)

—RLC

A CONSIDERED REVIEW

PROPOSAL TO PROTECT NORTHWEST STREAMS FROM NEW HYDROPOWER DRAWS HUGE PUBLIC RESPONSE

Compiled by Judy Allender

Through the Northwest Power Act of 1980, Congress directed the Northwest Power Planning Council to develop a program to "protect, mitigate, and enhance fish and wildlife, including related spawning grounds and habitat" in the Columbia River Basin. Because the program is funded by ratepayers, the Council was to address its efforts solely to the impacts of hydroelectric development.

As the Council developed the Columbia River Basin Fish and Wildlife Program, several parties, particularly fish and wildlife agencies and Indian tribes, urged the Council to protect fish and wildlife from future hydropower development as well as past and existing dams. The Council agreed that protecting certain areas was integral to the program goal of doubling salmon and steelhead runs in the basin. So, a review of over 350,000 miles of year-round streams in the region was begun to determine their value for fish and wildlife populations.

Thus, the "protected areas" concept was born. The protected areas issue refers to designating certain Northwest streams as protected — that is, future hydroelectric development would be restricted — because of the poten-

Photograph by Ancil Nance

A CONSIDERED REVIEW

tial impacts on fish and wildlife in those areas. An estimated 35 percent of the anadromous (ocean-migrating) fish habitat in the Columbia River Basin has already been lost due to hydroelectric development. The U.S. Army Corps of Engineers and the Bureau of Reclamation continue to plan for future federal projects, and the Federal Energy Regulatory Commission (FERC), which licenses private and non-federal public hydropower projects, has at least 200 applications to build new dams pending throughout the Northwest.

The Council's staff compiled the information collected in its review of Northwest streams and released a Protected Areas Designation issue paper in October 1987. The Council is currently reviewing the comments it received on the staff issue paper and expects to make a decision in March or April on whether to enter rulemaking to amend the fish and wildlife program and the 1986 Power Plan.

This issue has received more response from the public than any other single issue the Council has dealt with. Over 470 organizations and individuals have commented on the issue paper. Below is a sampling of a few of the comments the Council received.

David Alden, President — Northwest Small Hydroelectric Association (NSHA)

The Northwest Small Hydroelectric Association is supportive of the protection of truly valuable or unique water resources. However, we are concerned about the proposed protected areas designation. We have numerous concerns such as protection out of the Columbia River Basin and the possible protection for non-fish and wildlife values. But we would like to focus on two *specific* concerns.

Our first concern is the overly broad criteria for protection. To evaluate the extent of the proposed program, we reviewed 18 recent small hydro projects in Oregon. We assumed that successful development through the current restrictive regulatory process indicated an acceptable site. However, we found that 16 of the 18 sites would be protected under the proposed program. Thus, the proposed program would preclude development at numerous reasonable sites.

Second, we talked with state staff in both Oregon and Washington regarding the accuracy of the data. In both states, it was estimated that perhaps 20 percent of the river reaches were incorrectly classified due to data errors. This level of inaccuracy is much too high to justify the program.

Rick George, Director — Oregon Rivers Council

The Oregon Rivers Council fully supports the [Northwest Power Planning] Council staff's recommendation to include in its protected areas designation all anadromous fish streams in the region as well as selected resident fish and wildlife sites. We believe it's critical that protected areas designation be included outside of the Columbia River Basin. We think that the program should be applied regionally in the same way that power planning and power sales are currently being applied by the Council. That is, the protected areas should also be regional in scope. We look at this as the first ever comprehensive effort of fish and wildlife and power planning. It's an historic step that *must* be taken. We also believe the data base that has been compiled is strong and accurate for fish and wildlife values and that it must be used and in that way strengthened.

Gary Johnson, Resource Development Manager — Tacoma City Light

The purposes of the Pacific Northwest Electric Power Planning and Conservation Act [Act] include assuring the region of an adequate, economical and reliable supply of electric energy; encouraging the development of renewable resources; and protecting, mitigating and enhancing the fish and wildlife of the Columbia River Basin. The purposes of the Act also clearly state that Congress did not intend the Act to limit or restrict the ability of local utilities to plan, develop and operate resources. The Act is intended to provide a balance between developing new resources and fish and wildlife concerns. The proposed protected areas designation plan does not achieve this balance and does significantly restrict the ability of local utilities to develop resources.

Tacoma City Light recognizes the importance of environmental and fisheries issues and supports cost-effective, reasonable and effective fish and wildlife protection and enhancement programs. We also believe new resources can co-exist with fishery and environmental programs. The existing FERC regulations, as supplemented by the Electric Consumer's Protection Act, provide ample safeguards for fishery and environmental protection. These regulations require developers to work very closely with fishery, wildlife and other environmental agencies and to perform detailed studies and evaluations of the site as part of the project licensing.

The suitability of a river for hydro development is very site specific. The suitability of a river for fish and wildlife for different species and different life cycles is also extremely site specific. The site specific data generated by these detailed studies enable FERC to maintain a balance between resource development and fish and wildlife concerns.

Kent Martin, Chairman of the Board — Columbia River Fishermen's Protective Union

I feel very strongly that the Council's staff should recommend the protected areas paper be adhered to both in the basin and in the region at large. There should be no more hydro development in any stream that is currently used by anadromous fish or is potentially usable, because we must hang on to the natural habitat we have left as well as the natural and wild spawning stocks that that habitat supports. Those stocks are critical to the genetic health and viability of not only our wild and natural stocks, but our hatchery stocks as well. I would like to point out that I am certainly not a wild-only advocate, but I do perceive the absolute necessity of keeping our wild stocks healthy for the sake of all user groups. I also feel very strongly that the dams are indeed another fishery and should be subject to some of the same kind of strictures and regulations as other fisheries.

Larry Peterman, Bureau Chief for Research and Special Projects — Montana Department of Fish, Wildlife & Parks

Western Montana has important resident fish and wildlife resources. The damage to these resources from past hydroelectric development, however, has been substantial. The Council has been mandated by the [Northwest Power] Act to develop a program to balance hydropower development with protection, mitigation and enhancement of anadromous fish, resident fish and wildlife.

Streams which have been included in Montana's protected areas list constitute irreplaceable resources where hydroelectric development would have significant adverse effects on fish and/or wildlife. The Council's pro-

A CONSIDERED REVIEW

tected areas designation program in Montana would lend a level of protection not currently available in our state. It would work toward achieving a balance between hydropower and fish and wildlife.

In fact, we believe the program is vital to achieve that balance. We would like to commend the Council for including the protected areas concept in its fish and wildlife program and recommend the Council enter rulemaking to amend the fish and wildlife program to designate protected areas.

Nancy Rockwell, Administrator, Resource Development Division — Oregon Department of Energy (ODOE)

ODOE supports the Council designating protected areas. We want the Council to designate areas both inside and outside the basin so undue pressure isn't placed on the areas outside the basin. ODOE also supports protecting non-fish and wildlife values. Jointly developed criteria and a similar process for determining fish and wildlife values would be needed.

During the rulemaking process, we hope the Council will explain how the protected areas designation will affect agriculture, forestry and land development. We also want to be sure all data bases are sound before designations occur.

Michael Rossotto, Research Associate — Northwest office of Friends of the Earth

The Council staff's issue paper outlines a reasonable, logical and legally defensible approach to protecting critical habitat from new hydro development. We feel it is completely appropriate for the Council to request that FERC defer licensing new hydro projects in protected areas as long as there are less sensitive sites available.

The major concern we have at this point is the lack of protection for non-fish and wildlife values such as recreation and scenery. Efforts to whittle away the wildlife and resident [non-ocean migrating] fish protection will lessen the value of the program for potential developers. To the degree that the Council includes all resource values and all sensitive habitat, developers could realistically expect to develop sites not covered by protected areas designation with a minimum of conflict from the environmental community.

If, on the other hand, important areas are not designated protected, developers will still run the risk of being challenged when they try to develop in one of these non-designated areas. We also fully support the Bonneville Power Administration's proposal to make intertie access dependent on compliance with the protected areas program. There's simply no reason to allow the California market to serve as an incentive for inappropriate hydro development in the Northwest.

Mitch Sanchotena, Executive Coordinator — Idaho Steelhead & Salmon Unlimited (ISSU)

The concept of protected areas designation preserving and protecting our remaining salmon and steelhead habitat deserves the support of everyone associated with anadromous fisheries in the state. The compromises already reached during the three years of planning that preceded this proposal are truly milestones in the battle between power and fish. They illustrate the potential for cooperative efforts between long-time adversaries.

The staff's issue paper affords excellent protection to the remaining anadromous fisheries of the basin. The proposal balances fish and energy while providing a means of protecting the region's substantial investment in both.

ISSU will place support of this proposal at the head of its list for action during the coming year. It's a keeper. We believe the Council and its staff deserve commendation for their ingenuity and commitment to finding an equitable solution to the problem of fish versus power.

Marc Sullivan, Executive Director — Northwest Conservation Act Coalition (NCAC)

NCAC believes the designation of protected areas is absolutely essential to the success of both the Council's fish and wildlife program and its power plan. If we are to have any hope of achieving the interim goal of doubling anadromous fish runs, we can't afford to lose any more habitat.

Also, designation of protected areas, inside and outside of the Columbia Basin, meets the Council's congressional mandate to consider environmental costs in evaluating the cost-effectiveness of new resources. By implementing this designation, we believe you would find that in the protected areas the environmental cost of hydropower development is so prohibitively high as to render proposed projects non-cost-effective.

Larry Wimer, Fisheries Program Coordinator — Idaho Power Company

Idaho Power Company supports the concept of identifying reaches of critical fish and wildlife habitat within currently undeveloped rivers wherein development of any kind would have adverse and irreversible impacts. We support this concept for basically three reasons. First, such designation would assist Idaho Power along with the Council and FERC in planning for the future. Second, identifying areas of critical anadromous fish habitat would enhance the Council's effort in reaching its interim goal of doubling run sizes. And third, such designations could protect previous ratepayer investments for anadromous fish throughout the Northwest.

However, Idaho Power feels very strongly that the authority to develop such a policy is the prerogative of the individual state and recommends the Council not take any action on this issue until the river protection legislation currently being developed in the state of Idaho has been adopted.

One technical problem that we believe the Council must rectify is that of how the Council staff arrived at individual stream reaches identified within the staff proposal. Virtually all of our existing hydro projects fall within the staff-proposed protected areas. It was not the intention of the Idaho Department of Fish and Game to include existing projects in protected areas. This is an intolerable situation for Idaho Power for planning and relicensing purposes. We recommend that any list developed should exclude reaches that have existing projects on them.

Al Wright, Executive Director — Pacific Northwest Utilities Conference Committee (PNUCC)

PNUCC believes that the protected areas program is not a good tool to do what the Council wants to do. We believe that the only way you can make a fair assessment of the benefits or detriments resulting from a hydro project is with a site-by-site analysis.

We have repeated time and time again that there was a time in the '70s where everybody was enamored with the concept that small hydro development would bail us out of an energy crisis. The result of that was a lot of proposed legislation and everyone saying all hydro projects are good. That was a bad idea. And now we're trying to take a broad brush approach to blanket prohibitions to hydro development, and *that's* a bad idea. An overreaction either way is no way to do hydro planning or adequate fish protection.

We have tried to offer the Council some alternate approach that says it is reasonable, within the Council's jurisdiction, to designate critical fish production areas that the Council wants to target to double the run size. Within those areas, the Council has a right to demand that any hydro development be beneficial to their goal of doubling the runs. The Council shouldn't try to preempt FERC's decision-making process.

THE INTERTIE ISSUE

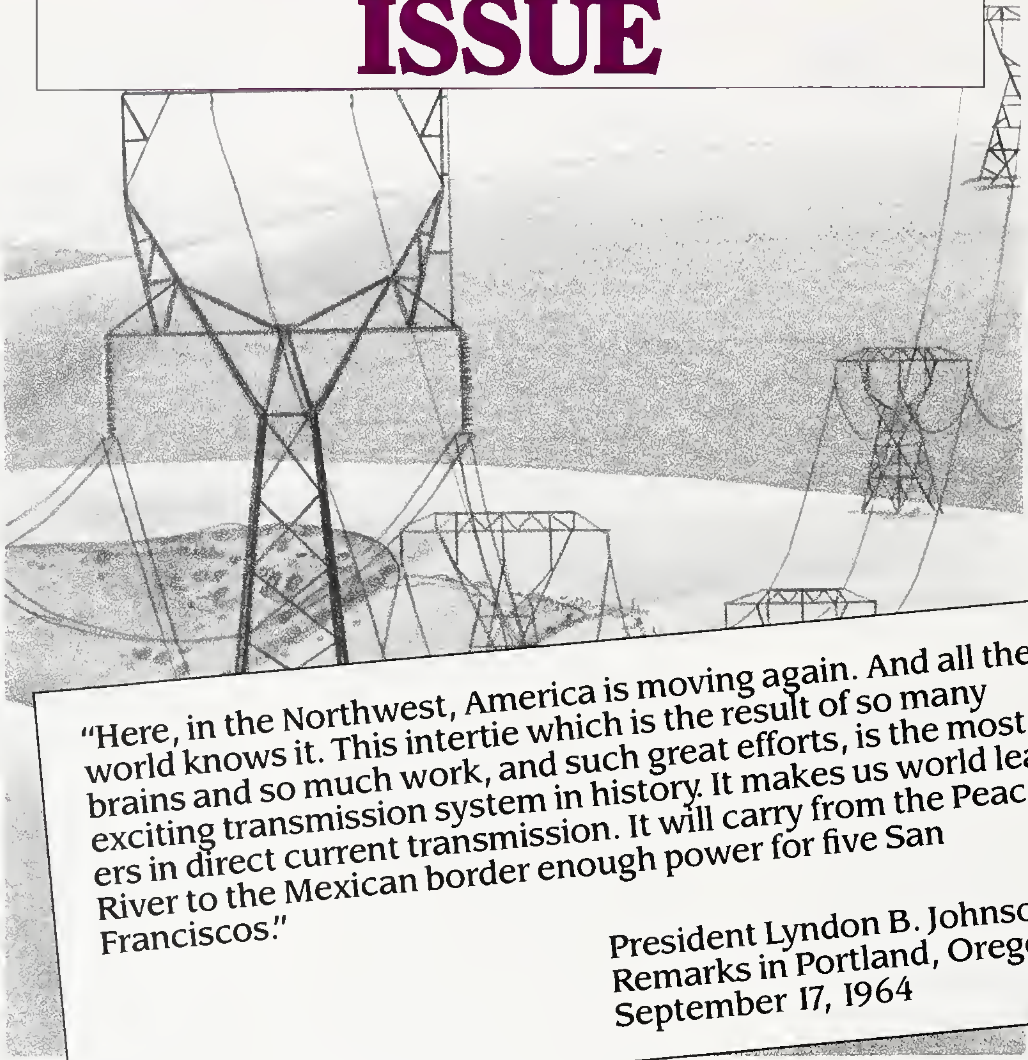


Illustration by Gary Whitley

> "Here, in the Northwest, America is moving again. And all the world knows it. This intertie which is the result of so many brains and so much work, and such great efforts, is the most exciting transmission system in history. It makes us world leaders in direct current transmission. It will carry from the Peace River to the Mexican border enough power for five San Franciscos."
>
> President Lyndon B. Johnson
> Remarks in Portland, Oregon
> September 17, 1964

by Ruth L. Curtis

If the Western landscape dwarfs men, then the giant transmission towers of the Pacific Northwest/Pacific Southwest Intertie are right in scale as they march across the hills from the Columbia River to Los Angeles. These towers make up the system so highly praised by former President Lyndon B. Johnson.

The idea of such a transmission system was originally conceived in 1919 by Professor Carl Edward Magnusson of the University of Washington. But it wasn't until the 1960s that the intertie system became a reality. The proposal to link the Northwest to the Southwest to transfer electricity made sense because of the differing electrical systems in the two regions.

In California, much of the electricity was and is produced with oil and gas generating units, while the Pacific Northwest produces cheaper hydropower. There has seldom been a year when the Northwest did not have more power than it needed to meet its contracted needs. The surplus non-guaranteed or nonfirm power, was available for sale, and California was eager to buy what it could get.

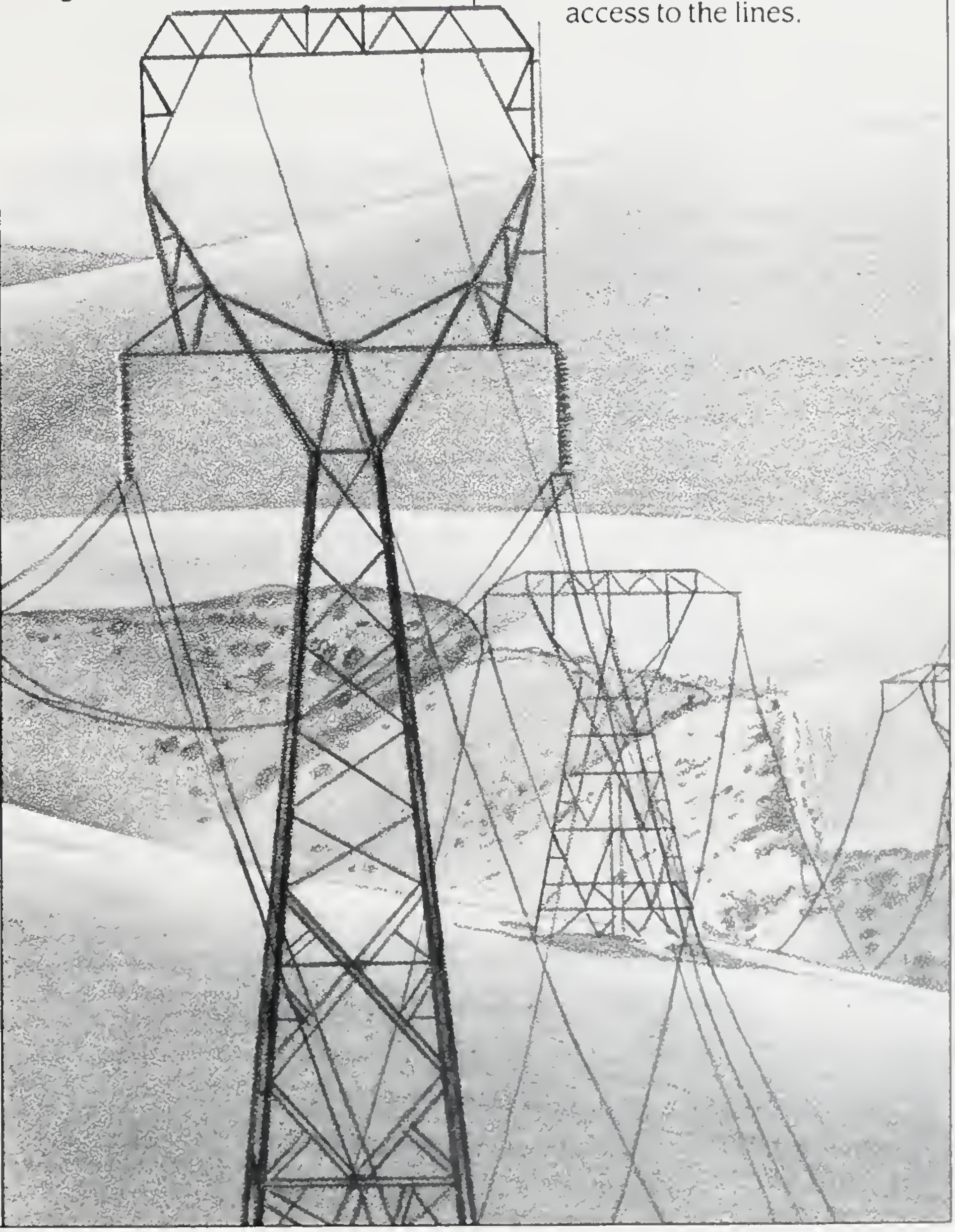
However, it was actually Canadian power that provided the impetus to build the intertie. The Columbia River Treaty with Canada was signed to cooperatively develop the Columbia River and apportion the associated power and flood control benefits. The storage dams built under the treaty produced huge amounts of additional power at downstream dams in the United States. Half of this power belonged to Canada under the terms of the treaty. But Canada didn't need this power and was very willing to sell it to California. This was firm power which California utilities badly wanted – electricity that could be guaranteed to be available even in years with low river flows.

The intertie was the solution – giving the Northwest and Canada access to California and other Southwestern markets. But there was concern about how to open up the Northwest's power to California markets without entitling California publicly-owned utilities to demand the firm power on the same priority basis as the Northwest public utilities. The Northwest did not want to become a power farm for other regions. Senators Henry Jackson and Warren Magnuson of Washington went on record saying, unless there was legislation guaranteeing the Northwest first rights to its own power, they would oppose the intertie.

These fears led to the Pacific Northwest Preference Act, which Congress passed in 1964. At the same time, Congress approved the construction of an intertie that would consist of four transmission lines – two alternating-current (AC) lines and two direct-current (DC) lines. The Bonneville Power Administration would own the DC lines and most of the AC lines in Oregon, while a collection of utilities that generated their own power and the Western Area Power Administration would own the southern portions of the lines. Bonneville would make the transmission capacity available to other utilities when it was not needed to transmit federal power. And finally, the Pacific Northwest was given first call on its own energy.

Begun in 1966 and completed in 1970, the intertie is the largest single transmission project ever undertaken in the United States. It is a system of two 500 kilovolt AC lines and one +/– 500 kilovolt DC line. (The second D.C. line was never built.) The alternating-current lines allow deliveries to utilities along the way, while the direct-current line provides a direct shot all the way from the Columbia River to Los Angeles.

Begun in 1966 and completed in 1970, the intertie is the largest single transmission project ever undertaken in the United States.



Just about everyone involved would agree that the intertie has been a success. The Northwest has been able to make money selling surplus electricity, over a billion dollars since 1970, and California utilities have been able to get cheaper power than that produced at their expensive generating plants.

In recent years, prompted by the success of the intertie and by another regional power surplus, utilities and planners in the Northwest began looking at ways to sell more power to the Southwest. At the same time, because there was such competition for space on the intertie, utilities asked Bonneville to provide them more dependable access to the lines.

To solve the first issue, Bonneville proposed upgrading the terminal facilities of the DC line and building a third AC line. This new line would have two parts, first a new 500 kilovolt line from the Oregon/California border to the Sacramento area, and second, reinforcing the AC intertie system in Oregon. A recent Bonneville draft study on the economic benefits of expansion of the tieline to California found that, considering the costs and benefits to British Columbia, California and the Pacific Northwest, the DC terminal expansion and the third AC line would show substantial benefits. That study is currently being revised and updated.

To broaden opportunities for utility access to the transmission system, Bonneville began to develop a near-term access policy in 1983, which would operate until a long-term policy could be developed. That near-term policy was first put in place in September 1984 and was finalized in June 1985. The long-term policy is currently being developed. The associated environmental impact statement incorporates evaluations of the environmental effects of the DC line upgrade and the third AC line proposal. A first draft was issued in 1986, a revised draft was released in December 1987, and the final policy is expected to be completed this spring.

The intertie access policy would determine who will have access to the intertie, what kinds of resources can be sold over the intertie, and what types of sales will have priority. The Northwest Power Planning Council has been following the policy's development closely because it will have a major effect on the region's fish and wildlife, as well as on the Northwest's power system.

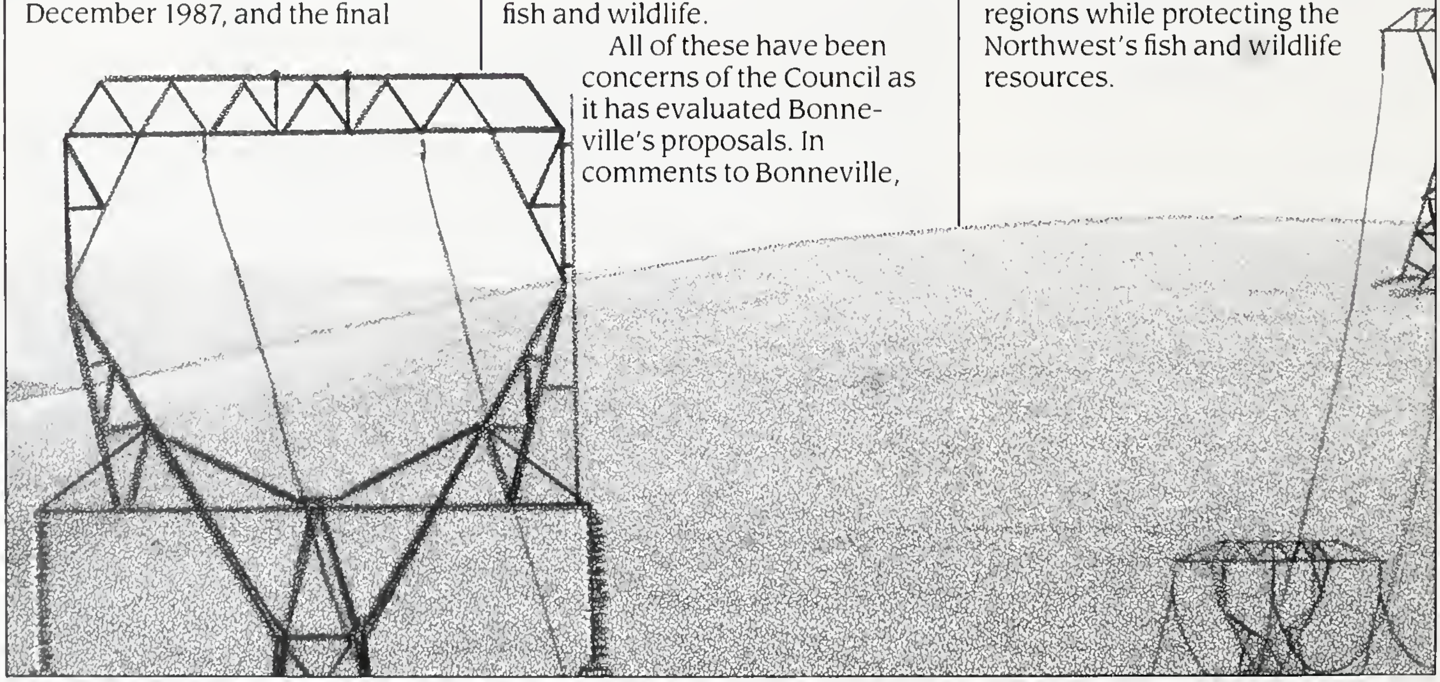
A carefully designed policy will encourage regional cooperation. But, if the policy is badly designed, it could encourage the development of new, non-cost-effective or unnecessary resources. In addition, the expansion of the intertie could result in significant changes in the operation of the region's hydroelectric system—changed river flows, changes in the characteristics of the reservoirs, and reductions in the amount of water spilled at the mainstem dams.

These changes could adversely affect fish and wildlife, destroying the work that has been done to rebuild those populations already seriously damaged by the hydroelectric system. A flawed policy could also encourage the development of new power generating projects without regard to the harm they might do fish and wildlife.

All of these have been concerns of the Council as it has evaluated Bonneville's proposals. In comments to Bonneville, the Council cautioned that generating resources not consistent with the fish and wildlife measures of the 1986 Northwest Power Plan and the Columbia River Basin Fish and Wildlife Program should be denied access to the intertie on the basis of their impact on fish and wildlife.

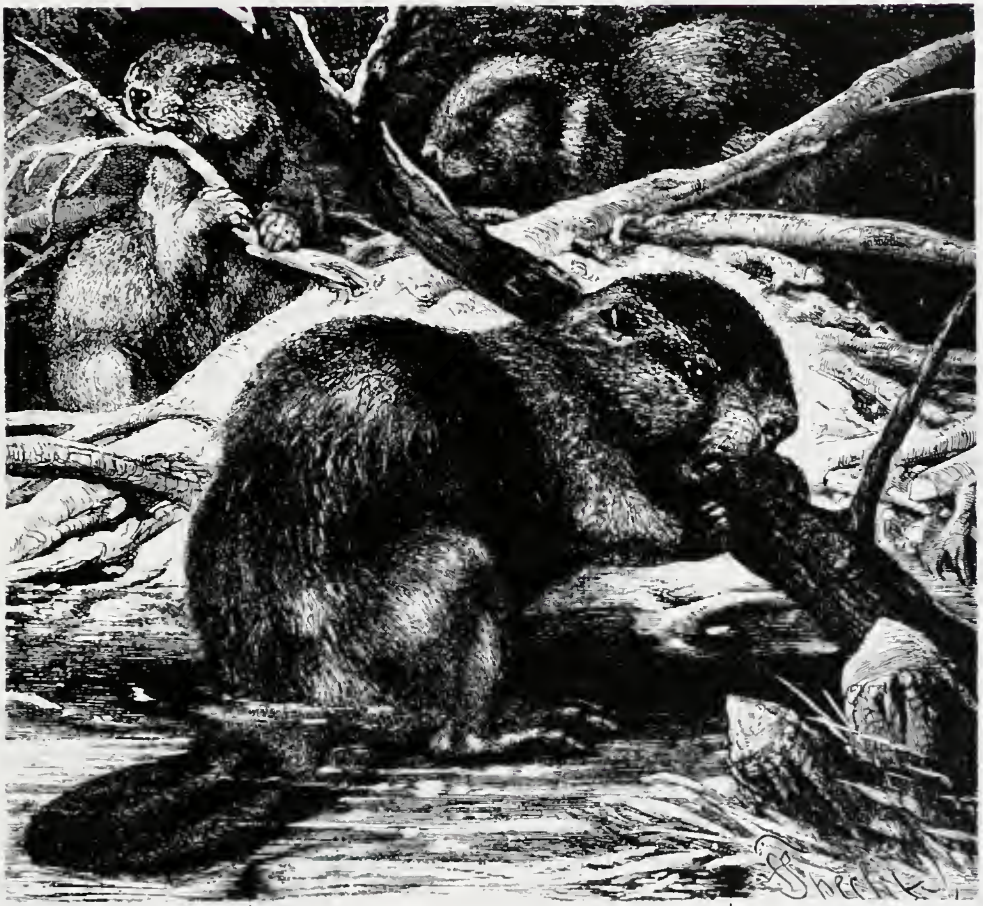
The Council also supported two provisions of Bonneville's proposed policy that affect resource development. One provision provides access to the intertie for seasonal exchanges of power. This was widely sought by Northwest utilities and should aid in promoting regional cooperation and reduce the construction of new resources in both the Northwest and California. The second provision is a "Waiver of BPA Service Obligation." Such a waiver should help the Northwest avoid a situation where Bonneville must acquire new resources to serve loads that would have been served by existing resources if the power had not been sold outside the region.

The intertie lines between the Northwest and California have provided tremendous benefits to both regions over the past 18 years. The challenge today is to ensure that the power lines continue to provide long-term savings by reducing the need for generating resources in both regions while protecting the Northwest's fish and wildlife resources.



MAKING UP FOR LOST LAND

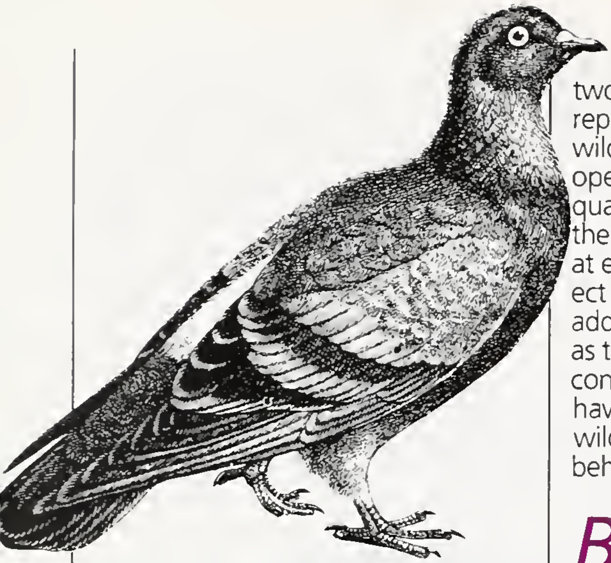
by Carlotta Collette



Awash behind the wall of Grand Coulee Dam lie 70,000 acres of forests and grasslands, dry steppes and shrub-covered savannas. Before 5-million acre feet of water (about 10 percent of the Columbia River's average annual flow) drowned them out, there were grain fields and a few orchards. Along the old channel of the Columbia and the inundated mouths of the Spokane, Sanpoil, Colville and Kettle rivers, there were fertile shorelines that drew herds of deer and flocks of waterfowl hungry in the spring to forage early on the first green grasses.

All of this is gone now, flooded out in 1942 when the cold water of the Columbia piled up a lake 385 feet deep, 151 miles long and 4,650 feet wide on average. The mass of concrete (reportedly enough to build a 40-foot wide highway across America), whose innards generate enough electricity for six cities the size of Seattle, cut off salmon and steelhead runs at the dam face and eliminated home ground, grazing land or migratory resting areas for approximately 350 species of wildlife. And regular operations of the dam routinely raise and lower the new shoreline, scouring away the tenuous vegetation attempting to take hold and grow.

Because the Northwest Power Act called for reparations for both fish and wildlife lost as a result of hydropower development in the Columbia Basin, a plan of recovery for the damaged habitat and consequent loss of animals is currently before the Northwest Power Planning Council. Along with the plan to mitigate losses due to Grand Coulee, the Council is reviewing



proposals regarding eight dams in the Willamette River Basin, the Palisades Project on the Snake River, and three dams in western Idaho on the Boise and Payette rivers.

In 1987, when the Council amended its Columbia River Basin Fish and Wildlife Program, it incorporated projects developed by the state of Montana to recover flooded habitat for deer, bear, bighorn sheep, waterfowl and small furbearers. The work in Montana is the first approved by the Council to rebuild wildlife populations. It was the result of productive negotiations between the state of Montana and Montana utilities.

As with the Montana plans, the new set of proposals are the third step in a lengthy process designed to quantify the impacts of hydroelectric dams on various species of wildlife. The first step involves information gathering and the development of status reports for each hydroelectric project in the Columbia River Basin. All past, present and planned wildlife recovery programs at dam sites are studied to determine whether new planning and repair efforts are needed. Status reports for all Columbia Basin projects were completed by fish and wildlife agencies and basin Indian tribes in 1984.

With status reports in hand, step two in the process draws together representatives from fish and wildlife agencies, the tribes, dam operators and others to attempt to quantify net wildlife losses that are the result of hydropower operations at each facility. In some cases, project developers have already addressed wildlife concerns such as the loss of habitat due to dam construction. In a few cases, there have been positive effects on wildlife created by the reservoirs behind dams.

Because of the enormous scale of the Grand Coulee project, the Council requested that interested parties skip step two and instead negotiate a plan of recovery immediately, rather than spend endless time and money debating the extent of the losses.

The plan proposed for protecting and rebuilding wildlife populations at Grand Coulee Dam is similar to those developed as step three in the planning process for each hydroelectric facility. The proposal has three parts:

1. Acquire approximately 73,000 acres of land or management rights to land to be used as wildlife habitat;
2. Improve and manage the land to perpetuate its use for wildlife;
3. Protect habitat identified as bald eagle territories and plant trees to be used as nesting sites.

The Grand Coulee project benefits would be divided between the Colville Confederated Tribes, the Spokane Indian Tribe (both tribes lost huge reservation lands when Franklin D. Roosevelt Lake was created) and the State of Washington. The plan is estimated to cost about $41 million over the next 10 years, plus annual maintenance costs of about $1.5 million.

Drafts of the proposal were distributed among concerned parties, and the final plan incorporates the comment received and responses to that comment.

Once final mitigation plans are produced, they are submitted to the Council for review and approval. In public meetings, the plans are described and discussion of the merits and weaknesses of each plan are encouraged. Before the plans are implemented the Council will open the fish and wildlife program so it can be amended to incorporate the new measures.

In the case of the plans currently before the Council, Council staff is recommending that they be consolidated into one briefing paper to be reviewed in a single fish and wildlife program amendment process. It is expected that the issue paper will address the pending mitigation plans and the question of whether a wildlife mitigation policy may be needed to guide decisions on these and future plans. This issue paper is expected to be released in the summer with a Council decision regarding the amendment procedure expected in the fall.

Dulcy Mahar Interview with

RALPH CAVANAGH

In the public interest field, where the strength of one's argument must frequently overcome a lack of funding, the articulate Ralph Cavanagh stands out. As senior staff attorney and Northwest Energy Project director for the Natural Resources Defense Council (NRDC), he is considered the undisputed leading voice of the environmentalist position in Northwest energy circles.

Cavanagh appears equally comfortable and respected—though perhaps not equally embraced—whether talking with fellow environmentalists or with utility executives. One secret of Cavanagh's bilateral acceptance is his ability to compromise—although he might call it "building a consensus." Despite a tendency to collar-length hair, he is no radical do-or-die crusader in the "Sixties" mold. Instead, Cavanagh is a shrewd politician who knows when to rattle sabers and when to work within the system to get the best deal for his side. He can talk "lawsuit" with the best of the environmentalists, but he's just as willing to sit down and negotiate if he believes he can get results.

Cavanagh works out of NRDC's San Francisco office. Founded in 1970, this national environmental organization also has offices in New York and Washington, D.C. Approximately 4,000 of NRDC's 77,000 members and contributors live in the Northwest, and the Northwest Energy Project is the organization's oldest regional project. Cavanagh suspects the region has loomed disproportionately large in NRDC's "institutional consciousness" because four of the original founders were Oregonians.

A New Englander by birth (New Hampshire), Cavanagh attended Yale as both an undergraduate and graduate student, receiving a law degree in 1977. After a stint with the U.S. Department of Justice, he joined the NRDC staff in 1979. He has taught energy law at both the Harvard and Stanford law schools, and is a member of the Energy Engineering Board of the National Academy of Sciences. He is married to a Stanford Law School professor, which explains, he says, why he doesn't live in the Northwest.

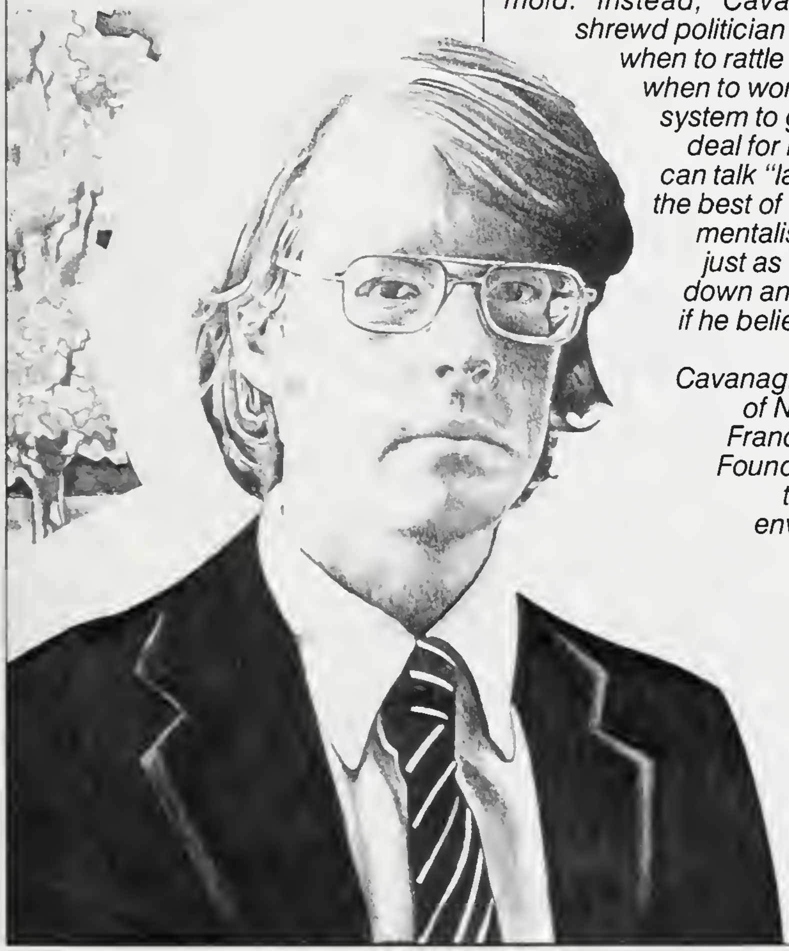


Illustration by Lynn Carson

Q. As the Northwest Power Act was being developed, the environmentalists' coalition was the only group really opposed to it. Why was that and what happened to change that opposition, assuming that attitude did change?

The opposition of the environmental coalition reflected a concern that the primary impact of the Act would be to break down barriers to the construction of more large-scale coal and nuclear plants in the Northwest. I will freely acknowledge that in the final analysis those concerns proved to be misplaced. The concerns were very real at the time.

It's important to remember that at the time the Act was being debated, the Northwest was in the middle of a nuclear power construction program unrivaled in North America. It was also building a number of coal-fired plants, and there's no question that the agenda of many of those who supported the bill included what they perceived as the opportunity to speed up construction of such facilities.

Now, the parts of the Act that speak to that agenda have never been used. But they accounted for much of the opposition of the environmental community.

Many of those who supported the Act saw the conservation provisions as lip-service that would never amount to very much.

Q. Is the concern at rest now because the electricity surplus has put a hold on acquisition?

That's not the primary reason. Environmental groups feared initially that the Council would be captured by the Northwest utility community and would be turned into an instrument of that utility community's power plant construction agenda. Since the Act was passed, the Northwest utility community has changed, and the Council has proved to be a very independent and creative force in the Northwest. Environmental groups couldn't be sure of this development before the Council even existed, but it has been a very pleasant surprise for all of us.

The reason that the region didn't embark on a power plant construction binge wasn't so much because of the surplus, which only became evident several years after the Act was passed. I think it was rather that the Council quickly came to appreciate and understand the case for cost-effective conservation as an alternative to power plants. The Act helped put a number of mechanisms in place that really got conservation going. Again, the reason we didn't expect that at the beginning was that most of those who supported the Act dismissed conservation as a contributor to the Northwest's energy future. I think it's fair to say that many of those who supported the Act saw the Act's conservation provisions essentially as lip-service that would never amount to very much. They probably have been as surprised as anyone with what's happened.

Q. You've been an observer throughout of the Council's tenure. How has the Council changed, and have the new personalities coming into the Council changed it, either in quality, flavor or direction?

There obviously has been a transition from a body whose major focus was creating the regional energy plan to a body whose focus is making it work. We've gone from creation to implementation. The challenges facing the Council have changed, even over the course of such a brief lifetime. You can look back at the initial years when you were coming to grips with the analytical question of how do you create a 20-year, least-cost power plan. That was an enormous challenge.

The Council was really the first body in North America that confronted and solved that problem convincingly. Everyone else has benefited from the agonizing work that the Council and its staff did over that time. That's a period that tracks roughly from 1981 to 1983.

Then, to some extent, there's a transition from 1983 to 1985, between the first and second plans, where there's still a lot of that creative agony, but also the beginning of a move into implementation. Now, I think you're firmly in a posture of implementation, working things out with Bonneville [Power Administration] and the region's utility community.

Q. Where do you feel that the Council has been the most successful and the least successful?

Well, the plan itself is a triumph in terms of taking these least-cost principles and making them work convincingly and comprehensively and understandably in a document that really has become a model for utilities and planners all over North America. It still has plenty of weaknesses. There are still areas that are incomplete. The Council has done a much better job, for instance, on residential sector conservation than it has on commercial sector conservation. But there have been some major analytic achievements that led me and a number of others to nominate the Council for the Tyler Prize, which is the closest thing to a Nobel Prize in the environmental and energy arena.

I think the Council has found it more difficult—as we all have—to move the plan into the field and marshal the dollars for it and get the institutional actors behind it. In part, the Council has been a victim of developments over which it had no possible control, including Bonneville's fiscal crisis, which struck just as a number of the Council's programs were really beginning to work. There's no question that the Bonneville fiscal crisis has been the largest single impediment to getting the Council's work done in a timely and effective manner, but I'm confident that we will overcome that problem.

That's on the energy side. On the fish side, the scorecard won't be complete until we're through the protected areas struggle, which may be the most important decision the Council has yet had to make on fish and wildlife. If the Council can come through that process with a result that accomplishes the goals of the initial proposal without convulsing the region, we'll have achieved something on the fish and wildlife side comparable, I think, to what's been done already on the energy side.

Q. From your perspective, have you seen changes in Bonneville in the last seven years?

Yes, there have been some very positive changes. I have seen the evolution of Bonneville into what I regard as the nation's most accessible public agency. Bonneville has opened up. I think that Bonneville, and in part this is a reflection of interactions with the Council, has become much more open to the principles of least-cost planning, the priority and the promise of conservation.

While the recent fiscal problems have slowed some of that down, I don't think that they've in any way destroyed the very real changes in attitudes and practice over at Bonneville that are some of the most hopeful things that have come out of the last seven years.

The Council gets some of the credit for that. There's no question that Bonneville has learned a lot just in struggling with the Council to refine these concepts and put them into practice.

> There's no question that the Bonneville fiscal crisis has been the largest single impediment to getting the Council's work done in a timely and effective manner.

Q. You said earlier that the Northwest utility community isn't the same community it was when the Act passed.

At the time the Act was passed, the Northwest utility community was basically a construction community whose interest was in financing and building large generators. That was the primary focus of management, and that was where most of the opportunities for advancement lay. I think that's largely gone. The typical Northwest utility executive today has no interest whatever in financing or constructing a large-scale power plant.

From my perspective, the shift hasn't been altogether positive in that now the obsession with building large power plants has been replaced with an obsession for marketing and promoting additional electricity consumption. There are certainly some very dangerous aspects of that. But I'm also seeing some hopeful signs in the Northwest utility community in terms of people realizing that, in order to meet their marketing objectives, they're going to have to give conservation and efficiency a very substantial role. I think one of the best illustrations is the agreement NRDC reached with the Pacific Power and Light Company about how to accommodate Pacific's marketing objectives with the Council's plan and the whole thrust toward efficiency and minimizing future resource needs.

Q. You are in touch with energy planners throughout the rest of the nation. How does the Northwest compare, for example, in least-cost planning?

The Northwest is the model. The Northwest is the starting place for all of those discussions. For somebody who has watched this process evolve now over almost nine years, that's really extraordinary. Nine years ago the Northwest would have ranked near the bottom of any list on all those issues you're capturing with the phrase "least-cost planning." The Northwest has vaulted to the head of the class, in very substantial measure due to the Council.

Q. What other areas of the country are looking at least-cost energy planning?

Right now the stakes are highest in New England. For anyone with some historical memory, that region looks a lot like the Northwest did back in 1978 and 1979.

New England perceives itself on the verge of major supply problems. They've had several days recently where they've had to seek voluntary curtailment. They are casting about desperately for ways to provide substantial power supply and, quite frankly, compared to the Northwest their conservation policies are relatively undeveloped.

> The typical Northwest utility executive today has no interest whatever in financing or constructing a large-scale power plant.

A counterpart to the Northwest Conservation Act Coalition (NCAC), called the New England Energy Policy Council, has sprung up and is now working to try and apply the Northwest lessons in New England. What they tried initially was a sort of blueprint for a Northwest-style least-cost plan for New England.

Unfortunately, New England has not produced a multi-state agency comparable to the Council, which can look at electricity problems from a regional perspective. You've still got six narrow state perspectives, each viewing a different part of the same elephant and quite understandably not coming up with a very coherent image of the whole. But I'm hopeful that that will change.

More broadly, there are now some 37 states involved in least-cost planning activities that are analogous to what the Council has pioneered. I can assure you that almost everywhere that's going on, the Northwest Power Planning Council's plan is being referred to for guidance on how to proceed. There's no question the Council has created a model and now has the responsibility of making sure that it is kept in good repair.

Q. What do you feel are the key Council-related issues facing the Northwest?

For fish, it's protected areas. For energy, it's Bonneville's long-term intertie access policy [see related story on page 12], which needs to incorporate both environmental and resource planning safeguards. There is at least some progress in that direction, which we must hold and sustain. Also, there's the whole challenge of how to handle the new marketing emphasis within the utility sector. How do you integrate that with the Council's plan and objectives?

We need to make a great deal more progress in working with the state utility commissions. The Council's agenda and the utility commissions' agendas are simply not together to the extent that they need to be. I think that WPPSS [Washington Public Power Supply System nuclear plant construction program] is now largely behind us, which is good news because, in its extraordinarily long and messy death, it has used up a lot of the best managerial talent within the regional utility sector. There's more than enough for those people to do now that they can focus on some new challenges.

Q. What is your association's stand on the protected areas issue?

Protected areas is a vehicle for trying to ensure that hydropower development doesn't go on in places where it doesn't belong. It's the first and most promising such classification effort for this region. We've been anticipating this from the Council for years now. The concept emerged soon after the Council's creation, and it's taken us a long time.

My organization's perspective is that once you've dammed a river, you've done something with essentially permanent consequences. At a time when the Northwest itself clearly does not need additional hydropower, one should be erring on the side of caution, if one has to err at all. The longer we wait to establish this classification scheme and to give some clear direction to the Federal Energy Regulatory Commission [which licenses non-federal dams], the greater risk we run that the Council will lose critical fish and wildlife habitat that is essential to meeting the goals that Congress gave you. So, our immediate priority is to get the protected areas program adopted as envisioned in the October 1987 proposal, which encompassed both the Columbia Basin and the out-of-basin areas that have been identified as needing protection. That will be a major priority.

Q. Are we being Pollyannaish about regional cooperation? Can the Northwest's utilities really work together with Bonneville?

You have to keep fighting for it. There are plenty of forces trying to pull the region apart. But, there's some powerful glue that often gets overlooked. For anyone who looks at it objectively, Bonneville is easily the cheapest and most reliable long-term supplier of power available to the region. Utilities are constantly making noises about finding other sources, or going it alone, or breaking away from the region, but that's just a good bargaining ploy for people trying to get Bonneville to make the best deals possible. To anyone who's really taking a hard and responsible look at long-term supply, the Bonneville competitive advantage is palpable and undeniable.

I think that advantage has been buttressed by the Council's own efforts, and here again the state utility commissions can also be invaluable. The fundamentals are there to hold the region together. Certainly we still have an integrated power system; we still have an interconnected set of utilities that have every interest and potential advantage in working together. Our challenge is simply to make them act on that advantage. We are not simply preaching here, we are working within a system that is contoured to favor the goal of the environmental community and the Council, which is regional cooperation and planning to ensure that the regional interest is always paramount.

Q. Bonneville's post-1988 payments for model conservation standards (MCS) for new energy-efficient construction have been controversial. There is talk that Bonneville has a revenue problem and needs to get out of the business of funding the incentives indefinitely. Is this legitimate?

I don't think so. First of all, when people talk about the MCS, they always talk in total dollar terms. Ten or 15 million dollars has been the total annual cost of the program. The critics of these payments seldom look at the cost per

kilowatt-hour saved. I would submit that for someone who is trying to decide whether a resource acquisition program is worth it, and that's what we're talking about here, the cost per kilowatt-hour is critical. Remember, we're dealing with a lost-opportunity resource. Everyone concedes that.

The question then becomes; how much is Bonneville paying to preserve that resource. The answer, by the Council's calculation, is between 7 and 11 mills per kilowatt-hour. Now the notion that this is in any sense an exorbitant price to pay comes hard to me when I see utilities pursuing projects like Cowlitz Falls, at far higher costs per kilowatt-hour, on the argument that, because it's a lost-opportunity resource, it's worth paying more. I agree with that logic, but the MCS is clearly the best deal available at the moment.

Now, as far as Bonneville is concerned, the other question that gets raised is equity. The concern is that Bonneville, in some instances, is helping defray the cost of MCS houses in service territories that aren't buying power from Bonneville. But, if you're not buying power from Bonneville, the maximum amount of reimbursement you get under the current system is 25 percent of your cost. If you divide 7 to 11 mills by four and come up with what Bonneville is actually paying for that part of the region's lost-opportunity resource, we're talking about 2 or 3 mills per kilowatt-hour, and we're talking about paying for that in utility service territories that are legally entitled to demand that the region buy them resources when the surplus disappears. So, looked at in the context of what you're getting and what you're paying, as a Bonneville customer investing in MCS somewhere else, these equity issues largely vanish.

We ought to be focusing on what that resource means to the region and what it's going to cost all of us to replace it if we don't have it. Those numbers dwarf the ones we're talking about here. The additional point I would make on the MCS is that some measure of flexibility is essential, because the amount you need to pay depends in large measure on how well you're doing. Once building practice is changed and once a substantial number of builders are routinely constructing MCS houses, the cost of compliance will tend towards zero and may even go negative. The need for incentives will be very much less. Conversely, if we're not doing very well and if participation remains something like the current level of 20 percent or so, we're going to need higher incentive payments in order to meet the Council's overall participation goals.

What I think we are craving for is an entity capable of recognizing the need for that flexibility and finding a way to sustain it. I don't know exactly how much we will need to spend on MCS in 1991. We may need a great deal, we may not need anything. What I'm pleading for is the flexibility to be able to go up or down as needed.

I recognize that in advocating that I also need to find ways to help Bonneville increase the flexibility of its budgetary process. Indeed, we have made proposals in that direction, involving, for example, either contingency funds or short-term borrowing authority that would allow Bonneville to unshackle itself from sudden swings in oil and gas prices or aluminum prices, which have had devastating short-term impacts on Bonneville budgets.

We need a way to level those swings out, and, at the present time, Bonneville doesn't have enough flexibility in that regard. Assuming that we can make some progress in that direction, the watchword for MCS funding should be flexibility. Utilities that don't like Bonneville spending so much money on MCS should concentrate on making sure that more of these houses get built, so Bonneville doesn't need to spend as much inducing people to build them.

Q. If you could, how would you change the plan or the program?

I would concentrate, in the plan, on upgrading the model conservation standards for commercial buildings, which lag woefully behind the state-of-the-art. The Council is now in the process of upgrading those commercial standards, so I'm hopeful there. But the weakest part of the current plan, in terms of capturing all of the cost-effective conservation resources that are out there, is clearly the commercial sector standards. I would also be working to try to get a better understanding of the industrial sector conservation resource, which, I think the Council staff would agree, is still largely a mystery to planners.

The final thing that I would want to do is attune the plan and the program more to the issues of intertie access and interregional power transfers. The Council has yet to take on many of the new challenges created by the fact that the real geographical boundaries of the Northwest region — for electric power purposes — now encompass the state of California.

Q. Is there something I haven't asked that you would like to speak to?

I think the Council's budget is woefully inadequate. I pointed out last year that the Council is allotted about one-sixth of the California Energy Commission's budget, to do a job which is at least as demanding and difficult as that of the Commission.

I'd offer one final point about what I regard as one of this institution's unique strengths. I generally have the greatest admiration and respect for the Council membership, but the relatively high turnover in recent years could have created substantial problems. A cohesive and enduring force, which I think has made an enormous difference to the Council's contribution, has been the staff of the organization. The Council's staff has developed skills that are immensely valuable to the entire utility industry of North America, and the Council is to be commended for assembling and holding a group that the entire industry yearns to raid. The achievements of that staff, in terms of the plan and program and their international influence, really are extraordinary and speak for themselves. I want to close by acknowledging as much.

CARVING UP THE CATCH

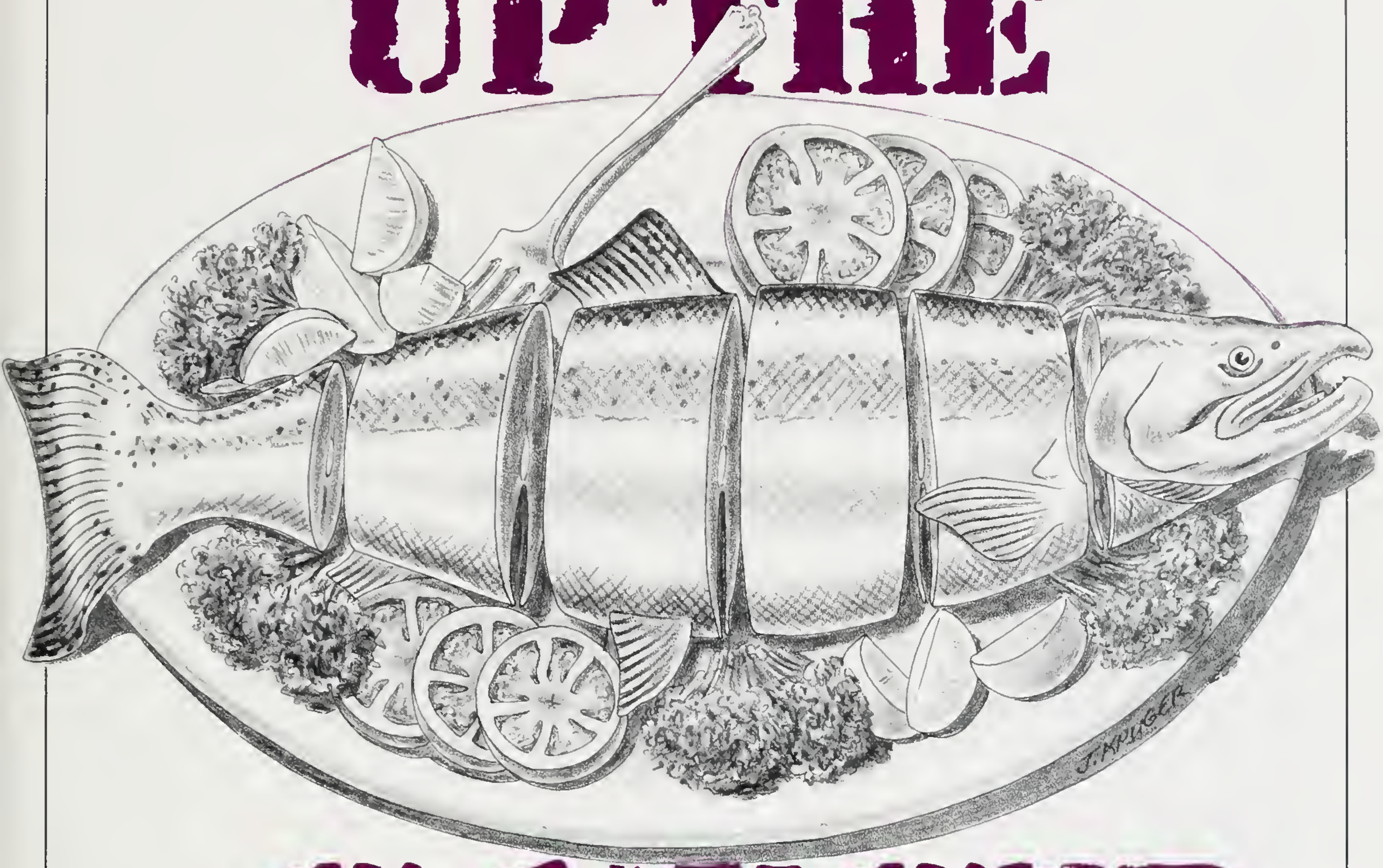


Illustration by Jerry Kruger

by Carlotta Collette

Commercial fishing for salmon and steelhead in the Pacific Northwest isn't what it used to be, according to the "old timers." "When I was a kid, you could make a living just fishing in the Columbia," says gillnetter Kent Martin. "Now most of us have to go up to Alaska to fish for summer and spring runs we used to catch in the river."

Ocean trollers have a similar problem. "North of Cape Falcon [on the Oregon Coast] we were restricted to seven days' fishing in May and two in July last year," complains Bob Haindel, who makes his living trolling for coho and chinook. Haindel and many of his colleagues head south to California to reap their harvests in the open-season fisheries that run from May 1 through September 31.

Sport fishing's suffering, too. Despite record chinook catches in 1987, there are still severe limits on some seasons and how many fish can be taken by any individual angler.

Some people blame the Indians, who have taken to court their treaty-based claims to an equal share of the fish — and won. Some trollers accuse the well-organized sport fishing community of gaining the advantage over the merchant fishers. Even between gillnetters and trollers there are verbal skirmishes that testify to the frustration on all sides. And in the middle of the dispute there are the fishery managers, representatives from the states and the Indian tribes, who must set the seasons that limit the catch of the Northwest's famed salmon and steelhead.

No one seems to envy the regulators. They must balance the practical day-to-day need for the fish as a valuable commodity — reportedly worth hundreds of millions of dollars in the region — with the longer-term necessity of rebuilding declining fish runs. Their job is made all the more difficult by the fact that several strains of salmon and steelhead school together in the ocean and return in overlapping shifts to the Columbia to migrate upriver and spawn.

This blending of fish with different heritages — some raised in hatcheries and others that are considered more or less wild — makes for what is called a "mixed-stock" fishery. The mixed-stock fishery confounds efforts to protect certain runs of fish that may have genetic characteristics scientists believe must be preserved if salmon and steelhead runs are to endure for future generations. Even when runs of some stronger stocks are excellent, the smaller runs of certain stocks among them must be guarded. So fisheries managers limit the overall number of fish that can be taken, and seasons are closed when quotas of the most precarious stocks are met.

Haindel calls it "an almost impossible situation. They are trying to meet all the various needs in a very complex fishery."

Martin agrees. To make his gillnet operation pay, he has to fish spring and summer runs in Bristol Bay, Alaska. "We've been sitting on the beach for years to protect the Columbia's spring runs," he says. But he acknowledges the need to curtail harvests of less numerous stocks in order to preserve the genetic diversity of the total runs. "Diseases wipe out hatchery stocks from time to time," he says. "We won't have any wild stocks left if we don't protect what we have," he reasons, "and there's no future for anyone's fishery without them."

> **"We need to shape the fishery now in order to provide a diversity of stocks and runs for the future."**

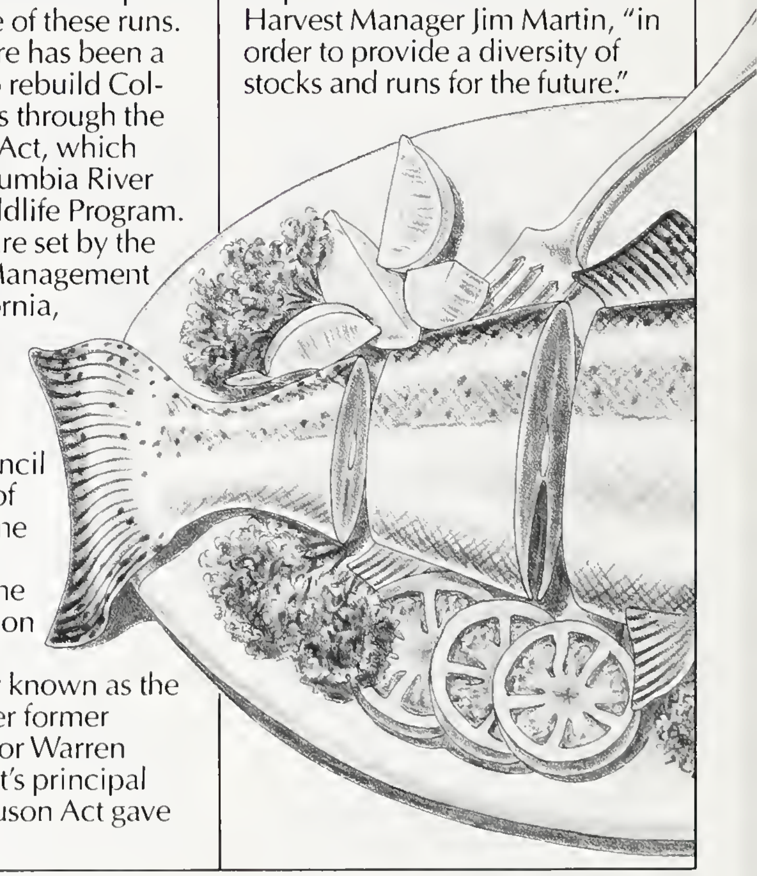
The Columbia River fishery has a history of harvest controls designed to protect the river's legendary runs. Since 1918, fishing seasons in the river have been cooperatively set by the states of Oregon and Washington through an agreement called the Columbia River Compact. But inriver harvest management alone has not prevented the decline of these runs.

Since 1980, there has been a concerted effort to rebuild Columbia River stocks through the Northwest Power Act, which mandated the Columbia River Basin Fish and Wildlife Program.

Seasons at sea are set by the Pacific Fisheries Management Council (off California, Oregon and Washington) and the North Pacific Fisheries Management Council (off Alaska). Both of these councils came into being after Congress passed the Fishery Conservation and Management Act of 1976, better known as the Magnuson Act after former Washington Senator Warren Magnuson, the Act's principal author. The Magnuson Act gave the federal government responsibility for managing the ocean fishery between three and 200 miles off the U.S. coastline. Ocean fishing seasons have been cut almost in half by these two regulatory councils. Each state manages its own inshore fishery.

Further control of the harvests was the goal and the result of the 1985 signing of the U.S./Canada Pacific Salmon Treaty. Through this treaty, specific limits are set on the number of Columbia River salmon and steelhead that can be caught in Alaskan and Canadian waters.

While planning for the coming fishing season is year-round, it is especially intense from December until the decisions are made, usually only days or weeks before the actual opening of the season. The complexity comes into play when all of the regulating bodies and the needs of each of the benefiting groups are weighed against the short-term and long-term plans for the fishery. "We need to shape the fishery now," says Oregon Department of Fish and Wildlife Harvest Manager Jim Martin, "in order to provide a diversity of stocks and runs for the future."

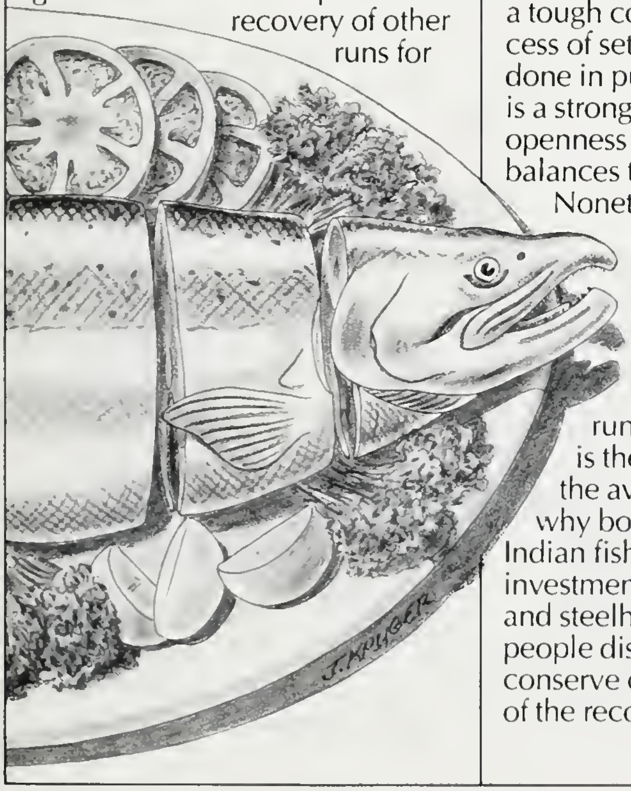


Martin's 20-years' experience in fishery management serves him well as he reviews reports on the previous season's catches and the number of salmon and steelhead that made it back up the Columbia to spawn (called the "escapement"). These post-season reports are compared with the coming year's pre-season expectations and reports documenting the many activities aimed at enhancing the fisheries and increasing salmon and steelhead populations.

By pulling together last year's counts and the coming year's estimates of the numbers of fish, managers have a numerical base for their planning efforts. Then they must begin to balance the number of fish they will allow to be harvested with the number they must let "escape" back up the river to replenish the runs. The escapement figure is key to determining the size of the catch to be divided up.

Because of the need to preserve certain weakened stocks, escapement levels are based on the most threatened but still valuable runs. This trade-off may mean that abundant stocks are underharvested in this generation in order to permit the recovery of other runs for future generations.

The outcome of all this apportioning is always a tough compromise, so the process of setting the seasons is done in public meetings.



With escapement goals set, the managers begin the arduous task of divvying up the harvestable fish among tribal and non-tribal fishers, commercial enterprises and sport anglers. Indian fishers hold court-approved treaty rights to share half the harvestable fish. Regulators must first take into account the Indian ceremonial or ritual use of the salmon, then the tribal subsistence fishery. The remaining harvestable fish are then allocated to Indian and non-Indian commercial and sport harvests.

The fishery is also divided into an Alaskan/Canadian harvest; Oregon and Washington coastal harvests; and an inriver or terminal harvest. The outcome of all this apportioning is always a tough compromise, so the process of setting the seasons is done in public meetings. There is a strong emphasis on this openness to provide checks and balances to the process.

Nonetheless, the discussions can heat up, and dissatisfied participants may turn to the court system as final arbitrator.

The smaller the total run size, the more volatile is the process of carving up the available catch. That's why both Indian and non-Indian fishers have an enormous investment in rebuilding salmon and steelhead populations. Few people disagree with the need to conserve certain stocks as part of the recovery. But gillnetter Martin points out that the bigger problem is that some of the runs have been "turbined out of existence" by Columbia River Basin dams. Limiting harvests alone will not enable the Columbia Basin fisheries to recover, he argues.

Despite the fact that the Northwest Power Planning Council does not regulate harvests, the Council does support careful harvest management. But the Council's fish and wildlife program also urges that increased salmon and steelhead production and improved fish survival past hydroelectric dams will be required if salmon and steelhead runs are to be doubled.

Given the need for action in all three areas, the fish and wildlife program outlines a schedule for improving fish bypass facilities at each mainstem Columbia dam. Already, newly installed screens to prevent young fish being drawn into dam turbines have improved the chances of survival at some projects. In addition, a spring release of water from the dams, called the water budget, and timed spills of fish-laden water over the dams help hasten the young salmon and steelhead on their journey—further reducing fish mortalities in the system. On the production side, the Council has established a comprehensive planning effort to determine how runs might be doubled.

The outlook for Columbia River salmon and steelhead has perhaps not been better since the dams went in. But the work of balancing a multitude of interests continues to be extremely delicate. Nonetheless, these cooperative efforts of the states, nations, tribes and organizations, and the many individuals who share an interest in the Pacific salmon fishery are beginning to pay off.

FAST FOOD TAKES

CONSERVATION IN RESTAURANT DESIGN

by Jim Erickson
Washington State Energy Office

In the town of North Bend, Washington, where snow-capped peaks of the Cascade Mountain Range are the community's only skyscrapers, the golden arches of a McDonald's restaurant shine forth like a beacon. This new establishment (number 10,000-plus in McDonald's international chain), will help shed light on the virtues of energy efficiency.

Awarded the Energy Edge by the Washington State Energy Office and the Bonneville Power Administration, this restaurant opened in late 1987 as the most energy-efficient of all McDonald's restaurants. The Energy Edge is a research project funded by Bonneville to design and build super energy-efficient commercial buildings.

Data collected at the McDonald's restaurant and at 28 other Energy Edge buildings in the Northwest will be used by Bonneville and the Northwest Power Planning Council to learn more about the costs and benefits of construction that is at least 30 percent more efficient than buildings built to meet model conservation standards set by the Council.

Including McDonald's, there are four restaurants in the region-wide Energy Edge project. The other fast-food outlets are a Skipper's that has been in operation for more than a year in Seattle

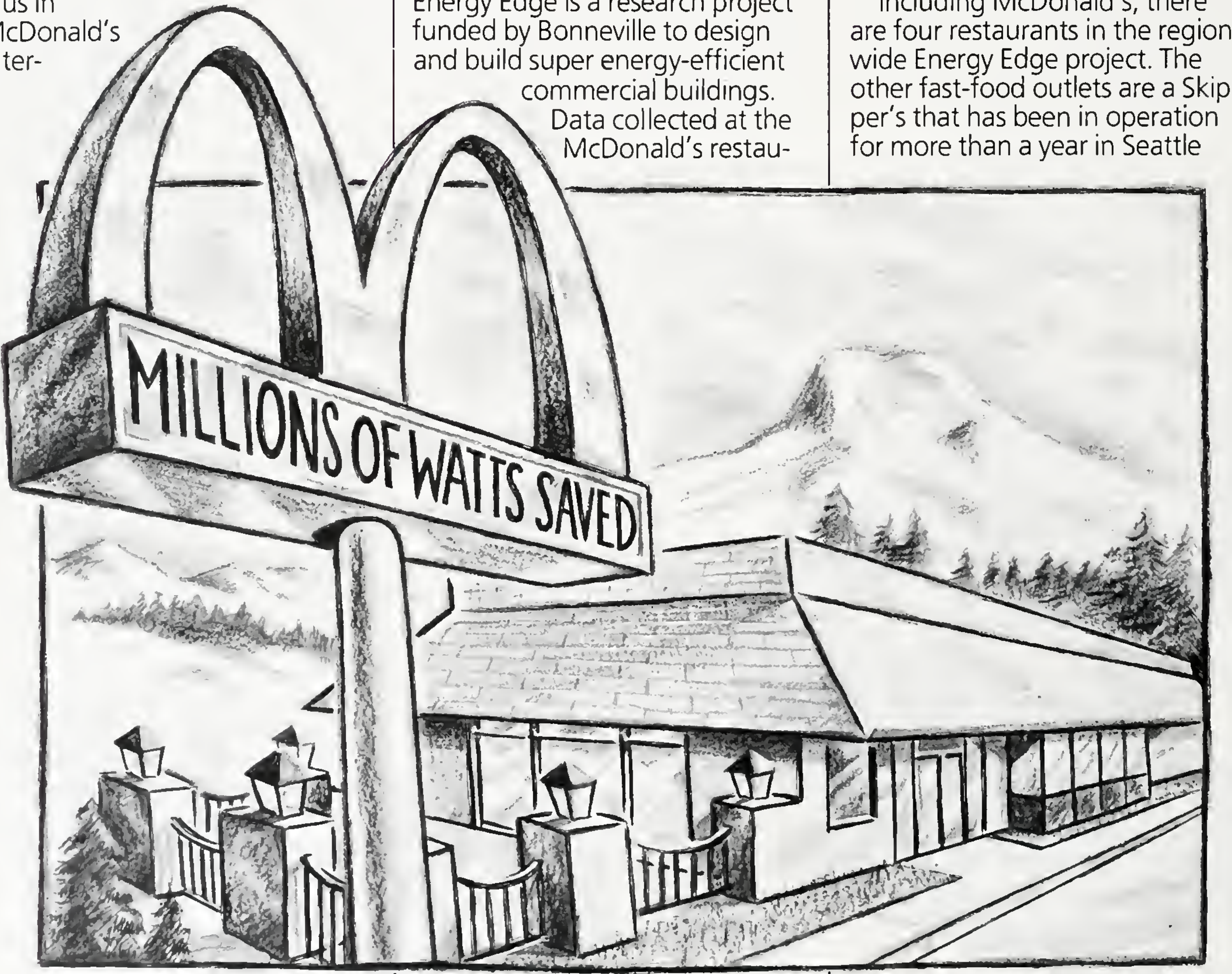


Illustration by Reed Darmon

AN ENERGY EDGE

and a planned Burger King in Vancouver, Washington. The other is a full-service restaurant, J. B. Steamers, which is under construction as part of Olympia's Boardwalk Building. All except Burger King are projects of the Washington State Energy Office. The Burger King building project is managed by Portland Energy Conservation, Inc.

Energy-efficient restaurants seem to be a prevailing focus throughout the national restaurant industry. As Bob Harrington, assistant director of technical services for the National Restaurant Association, explains, "There's still a lot of interest in energy efficiency, and there are efforts going on to achieve uniform standards for building envelopes and equipment." Furthermore, Jack Gordon, general manager and executive vice president of the Restaurant Association of the state of Washington, asserts, "Restaurant operators are aware of the advantages of power conservation and supportive of energy-efficient measures. They're saving power for tomorrow's generation as well as for operational costs now. And that makes sense."

But the four Energy Edge restaurants go well beyond the industry norm. In McDonald's case, some might suggest the restaurant chain is responding in such a manner because it takes its advertising jingle seriously, "You deserve a break today at McDonald's. We do it all for you."

When the North Bend McDonald's opened, there was a considerable amount of excitement generated throughout McDonald's corporate echelon. That was due partly to the chain's objective of using successes from this state-of-the-art building in the design of future McDonald's restaurants.

At the opening, Washington State Energy Office Director Dick Watson observed, "It was clear from the start that, to McDonald's, energy efficiency means a lot more than keeping the hot side hot and the cold side cold."

Following Watson, Ken Clement, regional vice president for McDonald's, offered his thoughts, "If it's claim to fame we're looking for in North Bend, it's to achieve the energy reduction that we're shooting for, and we're talking about 30 to 40 percent."

Of special interest to McDonald's is the building's performance as a result of the energy-efficient measures. The design of future restaurants depends on the results at the North Bend McDonald's, according to Franklin Tseng, regional construction engineer for the fast-food chain.

"We're the leader in the fast-food industry," Tseng says about the corporation. "We've been working on energy programs for a long time and have analyzed what we've learned. Until this [North Bend restaurant], we never had the chance to test all of our proven energy strategies in one building. We're very enthusiastic about this project. I hope the results show what the computer modeling showed."

The computer modeling, performed by North American Energy Services of Bellevue, Washington, indicated that the energy saving measures installed at the 4,300-square-foot North Bend restaurant would result in an annual energy savings of 110,000 kilowatt-hours, or an approximate $4,200 in annual cost savings. Those efficiency measures include a super ventilator for kitchen cooling, an innovative skylight and fluorescent lighting design, photo cells to control exterior lights, improved wall and ceiling insulation, and a heat pump hot water heater.

Doug Medley, engineering services manager for North American Energy Services, is impressed with McDonald's. "The corporation is very energy conscious," insists Medley. "They're sophisticated. They're organized. They not only investigate potential energy conservation for new buildings or retrofits, but they install conservation measures as pilots. Then, they take the end-use field data to determine if there were savings or not. After all that, they approve and implement measures for all their stores."

The other three restaurants in Energy Edge take energy conservation seriously, too.

Just ask Joseph W. Angel, president of Restaurant Management Northwest, Inc., the Portland-based company that is the largest Burger King franchise west of the Mississippi River, with 26 restaurants in the Portland area and southwest Washington. Burger King operates 6,000 restaurants worldwide.

Angel sees energy management as an essential tool to guarantee significant cost savings and reduced maintenance. He notes that computers can be used to maintain room temperatures and equipment.

"We're very enthusiastic about being in Energy Edge," says Angel. "It's a real step forward when you can utilize energy conservation concepts without sacrificing your commitment to provide customers with a pleasant dining experience." If the results are as expected at the Vancouver Burger King, he says, the chain is interested in incorporating the design nationwide in the construction of new restaurants and for retrofits of existing stores.

Nancy Benner, project manager from the sponsoring agency, Portland Energy Conservation, Inc., says the energy measures at the planned Burger King store will save an estimated 72,221 kilowatt-hours of energy a year and $3,611 in annual energy cost savings.

The strategies for this building will primarily cover the building's shell, lighting, and heating, ventilating and air-conditioning system. That is where computer modeling indicated there would be the greatest potential for electric savings at the least cost. The proposed building envelope improvements, for instance, include wall and roof insulation, and construction of entry vestibule to reduce air infiltration. Construction on the Burger King facility began in late January.

At Skipper's Aurora Village restaurant in Seattle, the annual savings of electricity is 74,500 kilowatt-hours and the yearly total energy cost savings amounts to $3,550. Both figures are close to computer modeled estimates taken prior to the restaurant opening a year ago.

All of the equipment the chain had tested in different restaurants since 1984 was put into this one store, including gas infrared fryers, a heat recovery system that recycles waste heat, and all-fluorescent lighting that allows the restaurant to cut 1.4 watts per square foot of electricity use without affecting intensity of illumination.

The energy-efficient measures installed in this Skipper's will be paid back in energy savings

PAYING FOR CONSERVATION

The Bonneville Power Administration has announced plans to continue payments for both the Super Good Cents and Early Adopter energy conservation programs. These are utility marketing and code adoption programs that help local jurisdictions and utilities meet the requirements of the Council's model conservation standards. The standards set energy-efficiency levels for new electrically heated homes and all new commercial buildings.

The idea behind the standards is that if new buildings are not constructed to be energy efficient now, they will consume electricity inefficiently long after the current electricity surplus is over. But if they are built to be energy efficient, the Council estimates that, with homes alone, depending on future economic growth, 130 megawatts to 790 megawatts of electricity can be saved at costs lower than all of the other possible resources available to the Northwest. If these homes are retrofitted with energy-efficient measures after they are built, the cost will be considerably higher.

To encourage the construction of energy-efficient buildings, the Council and Bonneville have sought the cooperation of utilities, builders, and state and local governments. In some areas the model conservation standards are being adopted in the form of building codes by local governments. Electrical utilities are also promoting them through marketing programs.

Bonneville provides financial assistance to support the Super Good Cents and Early Adopter programs. The agency assumed that these programs would secure 85 percent of the potential savings of the model standards by the end of 1988, and that payments could then end. While there has been great progress, the region has not yet achieved the targeted energy savings goal.

Consequently, Bonneville has announced that in 1989, payment levels will be about the same as they are in 1988, with the possible exception of climate zone 1 (western Oregon and Washington), where payments may be reduced to 80 percent if data indicate that the cost of constructing a house to the standards has been reduced. In future years, payment levels will be tied to market penetration rates. For every 10-percent improvement in the rate the standards are becoming accepted in building practice, payment levels will be reduced by 10 percent.

Bonneville reports it will also continue to maintain a strong emphasis on statewide building codes as the most effective way to achieve the valuable savings of the model standards.

Beginning in 1989, Bonneville will institute cost-sharing for model conservation standards payments in early adopter service territories. Bonneville and the Council will work with utilities, state utility commissions and local governments to facilitate a smooth transition to cost-sharing. —RLC within two years. Not only is this Skipper's using far less energy than other Skipper's restaurants in the region, but the improved energy efficiency means a reduced need for heating and cooling equipment. For Skipper's management, this means that future restaurants, built similar to the Energy Edge Skipper's, will actually cost less to build.

Skipper's — with more than 200 restaurants in 14 western states and British Columbia — is using this newest site as a prototype for future facilities.

When the Boardwalk Building is finished later this spring on Percival Landing in Olympia, it will include a J. B. Steamers restaurant that will feature three energy-conserving strategies. These are an air-to-air heat recovery system to use waste heat to preheat fresh air for the dining room and lounge areas, a heat pump using Puget Sound as a heat source and heat sink, and devices called "economizers," which allow fresh air for cooling during the summer.

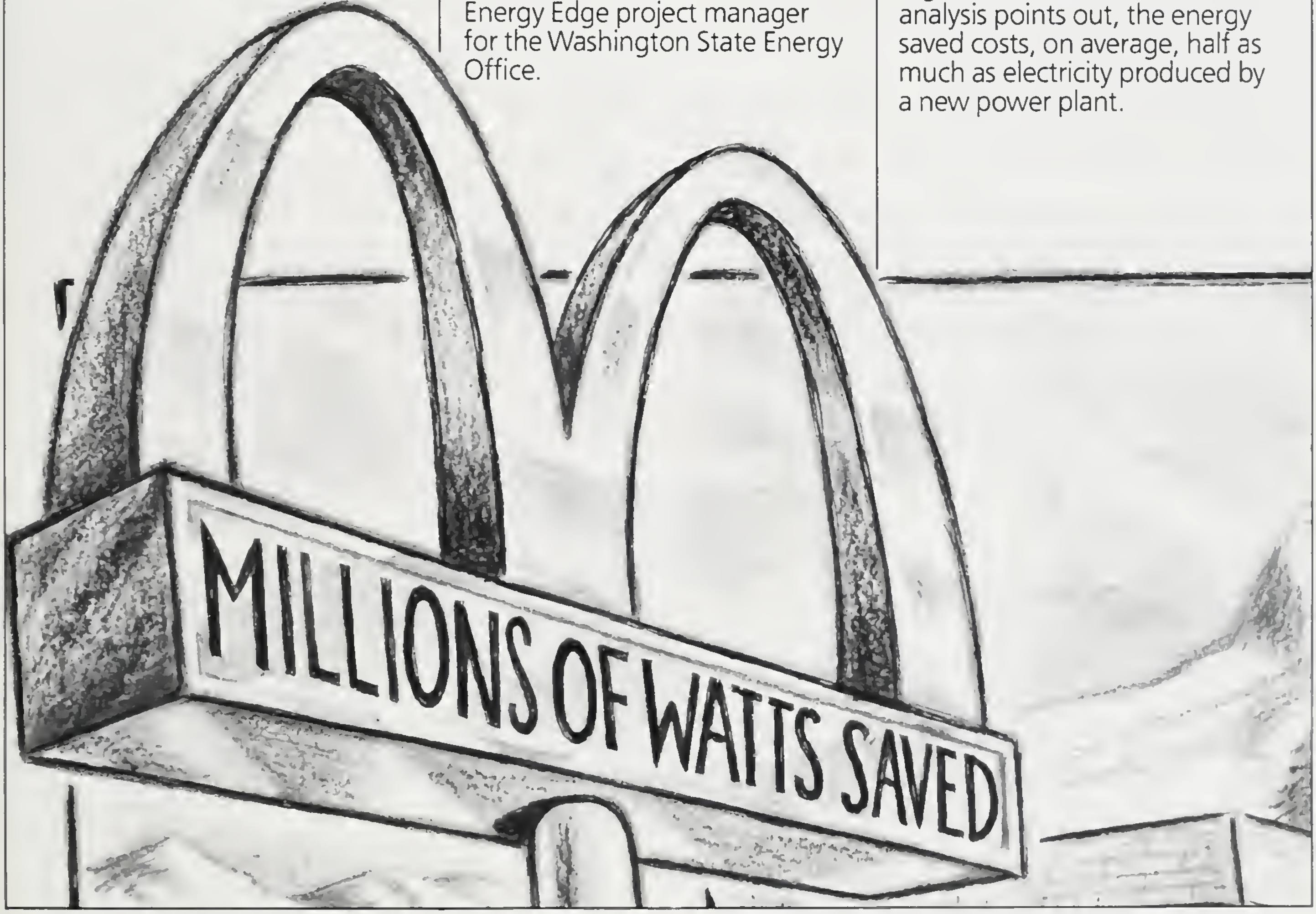
> "It's a real step forward when you can utilize energy conservation concepts without sacrificing your committment to provide customers with a pleasant dining experience."

The combined efficiency measures will result in estimated energy savings of 120,000 kilowatt-hours a year and a cost savings of $5,300.

With the fast-food restaurants, results on the buildings' performances come reasonably fast. That's one thing that particularly pleases Kim Drury, Energy Edge project manager for the Washington State Energy Office.

"So many fast-food restaurants are built over the course of a year," says Drury. "With energy efficiency being incorporated in both new and existing buildings, there is a great opportunity to learn how these energy conservation strategies work when applied to real operating conditions. In addition, since fast-food restaurants are also constructed "fast," there is an opportunity to obtain this information sooner than in the standard lengthy design/construction process typical for other types of commercial buildings."

Finally, while energy efficiency proves to be a good deal to building owners, it also pays off for the Northwest's other electricity users. As Tom White, Bonneville's Energy Edge manager, explains, "lower energy costs always make sense to building owners. But energy conservation also allows utilities to better predict electricity loads for all consumers in the region." As the Council's own analysis points out, the energy saved costs, on average, half as much as electricity produced by a new power plant.



SHORTS

Thirty-seven states are either studying or conducting least-cost electrical energy planning, according to a report by the Energy Conservation Coalition. The report, "A Brighter Future: State Actions in Least-Cost Electrical Planning,"is intended for use by utility regulators, legislators and electrical consumers. It explores the problems as well as the benefits of counting energy efficiency as a resource, when planning for future electrical energy needs. (For copies: Energy Conservation Coalition, 1525 New Hampshire Ave. N.W., Washington, D.C. 20036, 202-745-4874.)

Winners of a national energy design competition saved $2 billion in energy costs in a single year, according to the award's sponsors, the American Society of Heating, Refrigerating and Air-conditioning Engineers (ASHRAE). Projects ranged from ones that reduced electricity consumption to those that improved generating efficiency. (For more information: ASHRAE, Ann Taylor Boutwell, 1791 Tullie Circle N.E., Atlanta, Georgia 30329, 404-636-8400.)

Genes from wild Norwegian salmon are being stored in the world's first salmon sperm bank, to preserve the genetic diversity of salmon populations in Norway. Concerns that renegades from the country's extensive salmon farming operations are endangering the wild stocks, both by spreading diseases and by inter-breeding, led to the creation of the sperm bank. (Source: *Pacific Fishing,* 1515 N.W. 51st Street, Seattle, Washington 98107.)

An amendment to the U.S. Constitution guaranteeing environmental quality is being proposed by the National Wildlife Federation, the nation's largest conservation organization. The proposed amendment's draft language calls for "clean and healthy air and water, abundant fish and wildlife resources, conservation of our productive soils, and vigilant stewardship of our public lands." Similar guarantees are already part of the constitutions of eight other countries plus the European Economic Community. (For more information: National Wildlife Federation, 1412 16th Street N.W., Washington, D.C. 20036, 202-637-3742.)

Salmon burgers are "the greatest thing to hit the European market since sliced bread and zip-lock fasteners," according to one United Kingdom-based seafood company representative attending the 1987 world's largest seafood show in West Germany. West Coast U.S. salmon was the hottest selling item at the show, in part because of reductions in Norwegian salmon harvests and in part because of the weakened dollar. West Coast chum salmon is the main ingredient in the burgers. (Source: Pacific Fishing, 1515 N.W. 51st Street, Seattle, Washington 98107.)

A Super Good Cents home in Tacoma, Washington, was named "house of the year," by *Country Living* magazine, a Hearst publication. The Carpenter Gothic cottage, a cooperative project of the American Plywood Association, the City of Tacoma Energy Office, and numerous product suppliers, features 19th-century detailing coupled with 20th-century energy efficiency. House plans for the home are available for $95 from: Country Living Houses, Princeton Plans Press, Box 1735, Sandusky, Ohio 44870, 419-626-9320.

"Efficiency ... now displaces $250 billion worth of oil, gas, coal, and nuclear power annually in industrial market countries," concludes the "1988 State of the World" report of the Worldwatch Institute. Continuing this energy efficiency may be the only way to resolve some of the major problems facing the world today—war in the Persian Gulf, acid rain, rising carbon dioxide levels and economic crisis—argues the report. "Energy [use] fell ... about 6 percent in Australia and Canada [since 1973] ... 23 percent in the United States ... and 31 percent in Japan," the report noted. (Copies of the report, "State of the World 1988" are available for $9.95 from: Worldwatch Institute, 1776 Massachusetts Ave. N.W., Washington, D.C. 20036, 202-452-1999.)

U.S. Anglers spent about $18 billion dollars pursuing their catch in 1985, according to the Sport Fishing Institute. Fifty-nine million Americans spent 988 million days fishing in the same year. Each angler spends an average of $600 on the hobby every year, reports the Institute. Fishing license sales are also increasing while hunting license sales drop. (Source: *The Tributary,* newsletter of the Western Division of the American Fisheries Society, Box 428, Corvallis, Oregon 97339.)

Illustration by Reed Darmon

CALENDAR

April 5-6 — "Hydro Spring Seminar: Environmental Strategies and Planning Techniques" in Seattle, Washington. Sponsored by the Northwest Small Hydroelectric Association with the cooperation of the Northwest Power Planning Council and other organizations. For more information: Northwest Small Hydroelectric Association, P.O. Box 7528, Bend, Oregon 97708.

April 10-14 — The "Solar Energy Conference" in Denver, Colorado. Sponsored by the American Society of Mechanical Engineers. For more information: ASME Meetings Department, 345 E. 47th Street, New York, New York 10017, 212-705-7793.

April 13-14 — Northwest Power Planning Council meeting at the Sheraton Hotel in Missoula, Montana.

May 11-12 — Northwest Power Planning Council meeting in Washington.

June 8-9 — Northwest Power Planning Council meeting in Oregon.

June 15-17 — "National Low Income Energy Conference and Symposium" at the Hyatt Regency in Milwaukee, Wisconsin. Sponsored by a consortium of utilities, state and local energy assistance programs and non-profit institutions. For more information: NLIEC Conference, 3103 South Street, N.W., Washington, D.C. 20007, 202-337-0858.

June 20-24 — "13th Annual Passive Solar Conference" at Massachusetts Institute of Technology, Cambridge, Massachusetts. For more information: American Solar Energy Society, 2400 Central, Boulder, Colorado 80301, 303-443-3130.

June 27-29 — American Public Power Association's 1988 National Conference in Seattle, Washington. For more information: American Public Power Association, 2301 M Street, N.W., Washington, D.C. 20037, 202-775-8300.

June 29-30 — Northwest Power Planning Council's first annual salmon and steelhead roundtable at the Rippling River Resort near Portland, Oregon.

July 13-14 — Northwest Power Planning Council meeting in Sandpoint, Idaho.

A more detailed calendar of Council committee meetings and consultations is carried each month in *Update!* See order form on back cover.

Compiled by Ruth L. Curtis

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The Northwest Power Planning Council is required to develop a program to restore the Columbia fisheries and a regional electric energy plan, to be carried out by the Bonneville Power Administration, emphasizing cost-effective conservation and renewable resources

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Art Director Stephen Sasser
Special Departments Editor:
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Please send me a copy of the following publications of the Northwest Power Planning Council. (Note: not all publications are available immediately, but they will be sent to you as soon as possible.)

Publications

☐ 1987 Columbia River Basin Fish and Wildlife Program
☐ 1986 Northwest Power Plan
☐ 1987 Northwest Power Planning Council Annual Report
☐ Staff Issue Paper: Surplus Power In The Pacific Northwest
☐ Staff Issue Paper: Plans for a Technical Update to the 1986 Power Plan
☐ Issue Paper on Grand Coulee, Willamette Basin, Palisades, Black Canyon and Anderson Ranch Wildlife Mitigation Plans
☐ Western Electricity Study briefing papers:
  - Western System Overview
  - Electricity Use in the Western U.S. and Canada
  - Interregional Transactions
  - Existing Generating Resources (draft)
  - Future Resources (draft)
  - Load/Resource Balances (draft)

☐ Issue Paper on Model Conservation Standards for New Commercial Buildings
☐ Power Planning Division Work Plan
☐ Fish and Wildlife Division Work Plan

Mailing Lists

Please add my name to the mailing lists for the following newsletters. (Note: do not check if you already are receiving them.)

☐ *Northwest Energy News* (this bimonthly magazine)
☐ *Update!* (public involvement newsletter mailed with the Council meeting agenda)

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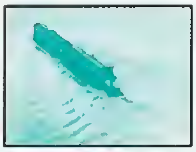
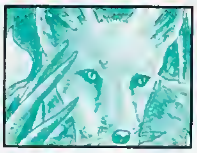


3 Ruling the River

How the Columbia River is managed—even during a drought.



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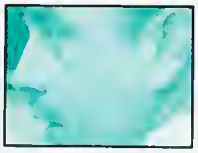
Council moves to designate streams needing protection from hydroelectric development.

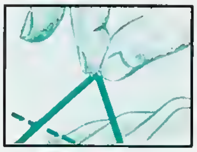


10 He's Howard of Howard's Grocery

His may very well be the most energy-efficient grocery in the world, and Howard Williams is very proud of the status.

13 Interview: Morris Brusett

Northwest Power Planning Council chairman from Montana.



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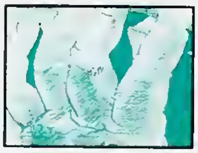
Conservation in the commercial sector requires more than just better building codes.



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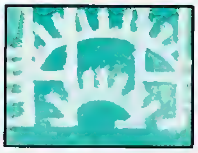

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An historic settlement aims to rebuild fish runs and harvests in the Columbia River Basin.

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31 Calendar

Editor's Notes

The spring chinook run on the Willamette River, just below our office, is the stuff from which legends are made. In 1960, the Willamette run numbered only about 24,000. Polluted water, hydroelectric dam operations and other causes had cut the run by more than three-quarters off the best years in the 1950s.

Oregon's Willamette clean-up effort, improved and increased hatchery releases, new operating regimes that enable young chinook migrants to safely pass the dams and improved harvest controls because of the U.S./Canada Pacific Salmon Treaty, have all contributed to this year's being the second highest run on record—estimated to total 97,000 fish by the end of the season. These are the days they will speak of when they tell how you could walk across the Willamette on the backs of anglers, stretched gunnel to gunnel awaiting their catch.

In this issue there are several new contributors, including representatives from the Council's legal division, John Volkman; and our new government affairs director, Steve Crow. Other stories came from one of the Council's Montana staff, Danny Parker (who has, since writing this, moved on to a new job in Cape Canaveral, Florida); and from Portland Energy Conservation, Inc. writer, Judy Branham.

Cover illustration is by Portland artist Jerry Kruger.

RULING THE RIVER

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"The river is a strong brown god, sullen, untamed, intractable, patient to some degree, at first recognized as a frontier; useful, untrustworthy as a conveyor of commerce..."
T.S. Eliot

by Ruth L. Curtis

Photographs by Ancil Nance

The Columbia River is indeed a strong brown god in the Northwest—useful but untrustworthy. It gives life to salmon and other creatures, provides electricity for homes and industries, gives nourishment to crops, conveys commerce through the mountains, offers pleasant weekends of playing, and only occasionally floods the land.

Fish, power, agriculture, transportation, recreation, flood control—all depend on the river.

These often competing uses make management of the Northwest's river system a fine, ongoing balancing act. Occasionally that balancing act is severely tested, as in low water years when the river again proves just how untamed and untrustworthy it actually is.

The Columbia River no longer flows freely as it descends from the mountains to the ocean. A few decades ago, dams turned it into a series of lakes with only a few remaining free flowing stretches. To make the river useful and safe, these lakes are now managed for society's needs, not according to the river's whim.

Over 200 water control projects dot the Columbia River Basin, subduing the water rushing through the system. Some of these are in Canada, and most are rather small. There are 19 major dams on the main sections of the river system in the United States. Most of these are "run of the river" dams with only a limited capacity to control the flow of water, while a few, such as Grand Coulee in northeastern Washington or Dworshak in Idaho, are storage dams with large reservoirs to hold water from one season to the next.

This stored water is needed roughly a third of the time to produce hydroelectricity; otherwise, the river's natural flows provide enough water to turn the generators. It is in the winter months, when the snowpack is building in the mountains, that this storage is used. It is then replenished during the bountiful spring runoffs from April to July.

Most of the actual rules of operation for the reservoirs at the hydroelectric dams are governed by the Pacific Northwest Coordination Agreement, which 15 major Northwest utilities, the U.S. Bureau of Reclamation, the U.S. Army Corps of Engineers and the Bonneville Power Administration signed in 1964. Running until 2003, the agreement coordinates the seasonal operation of each reservoir to ensure that the most use is made of the collective reservoir storage system.

> Over 200 water control projects dot the Columbia River Basin, subduing the water rushing through the system.

For the reservoir system, the year runs from August 1 to July 31, and each season has its own activities. Reservoirs are typically full as the water year begins. During the fall and winter months, there is little water streaming into the reservoirs because the snowpack is building in the mountains, although some water does come from rain. However, the reservoir is being emptied or "drawn down" because the colder and shorter days increase the Northwest's need for electricity. In addition, the reservoirs are being emptied in preparation for spring when the situation changes.

In the spring, the snowpack melts, producing a large inflow to the reservoirs. To prevent floods, much of this runoff must be collected in the reservoirs. Electricity use decreases, so less water needs to be released from the reservoirs. Some water, however, is released for the fish. These flows for fish are called the "water budget." They speed migrating juvenile salmon and steelhead to the ocean just as the spring runoff did before the river became a series of lakes.

By the end of the water year — July 31, the reservoirs should be full again and the system should be ready to enter the fall and winter months. Unfortunately, in drought years like this year the reservoirs don't necessarily fill up.

Throughout the year, there are operating levels or "rule curves" that must be considered at each reservoir for the system to work. These curves are developed every year under the coordination agreement and take into account the weather and the expected demands on the river system.

The "flood control curve" acts as a ceiling, telling operators how far down the reservoirs must be to have space for the flood waters that will come from the melting snowpack. This curve varies each year, depending on how much snow there is in the mountains. The "variable energy content curve" or "refill curve" tells operators how far down they can take the reservoir and still expect to refill it by July 31. And the "critical rule curve" is the level to which reservoirs can be drawn to produce guaranteed or "firm" hydroelectricity. In a series of very low flow years, operators are entitled to draw down to this critical rule curve to meet their obligations, even if the reservoirs will not be able to refill.

The critical rule curve is based on the so-called "critical period": an actual historic sequence of drought — 1929 to 1932 — that ushered in the dust bowl years. This was the worst drought on record. According to Wally Gibson, the Northwest Power Planning Council's manager of system planning and rates, what the curve implies "is that if you have a recurrence of that sequence of water years, you will just get from full to empty over the course of the four years using the entire storage system and the entire natural flow. And that determines the amount of hydroelectricity an operator is entitled to generate."

This critical period dominates power planning on the river system. By superimposing this driest series of years with today's river system, planners decide how to operate the system. The Bonneville Power Administration uses the following analogy to explain how critical water planning works:

"Imagine that you run a wholesale produce business. What your grocer and restaurant customers value is your ability to guarantee them a constant supply of produce. However, in some years your crop is large; in other years it's small. Further, let's say that you pride yourself on reliability. You recall a handful of seasons in the past when your crop was extremely small; you wish to guarantee to supply only the amount you could have supplied during that bad stretch. Your logic is simple: if you never allow yourself to guarantee more than you could have supplied in the bleakest period of your past, you can be virtually certain that you'll always be able to meet your obligations.

"Of course, you pay a price for this 'conservatism.' In years when the crop is better — and it almost always is — you can still sell the 'surplus' on the spot market. But when it can't be guaranteed, the value of the product — to your customers and thus to you — is diminished.

The so-called "critical period" is an actual historic sequence of drought — 1929 to 1932 — that ushered in the dust bowl years.

"Assuming you have no place to store up your merchandise, you could simply look back and find that stretch of seasons when your total crop was smallest, and then promise yourself never to guarantee your customers a supply greater than that worst-case average. If you had a warehouse, you could figure out how much that storage could add to your monthly guarantee, if you rationed out its contents over that bleakest period. And in the meantime, you could guarantee that much more to your customers each month."

The river system operators use reservoirs instead of warehouses and sell electricity produced by water rather than produce. But the principle of ensuring the reliability of the product is the same.

This year is dry despite the spring rains, and the overall water supply outlook for the Columbia Basin is far below normal. Gibson says, "except for Grand Coulee's Lake Roosevelt, the reservoirs are not expected to refill by July 31, and, in fact, they have been operated below the critical rule curve all year, because the natural flows have been worse than the 1928-1929 flows were. We are currently expecting to end up somewhere between 10 and 20 percent down from full reservoirs. What this means is that there is a possibility that next year the region could be where it was in the second or third year of the historic critical period."

Jim Jura, the Bonneville Power Administrator, recently told Congress that the Northwest was in for a long, dry summer. "Water conditions in 1987 brought about the tenth worst runoff in 61 years, and the current year is shaping up to be even worse ... We almost certainly will start the next operating year without full reservoirs."

Power producers are being conservative in marketing power, but there are no shortages. Gibson says he has found that utility representatives generally believe there is a lot of energy out there to cover power needs for next year.

But the issue is economics, not supply. "No one's lights are going to go out," comforts Jim Litchfield, director of the Council's power planning division. "The message here is that the problem we could experience next year is different from 1977, the last major drought where we ended up 28 percent down from full reservoirs. It is not likely to manifest itself as outages or curtailments, but nevertheless, it could be a problem in terms of economics, if we have to run expensive power plants or purchase high-cost energy."

For fish, things are a bit different. There appears to be little problem in meeting water budget flow requirements in the mid-Columbia River in 1988. The water is already stored in Franklin D. Roosevelt Lake behind Grand Coulee Dam. However, the likelihood of providing water budget flows this spring in the Snake River is not as good. There is not the storage available in that basin — most of the water budget on the Snake comes from natural flows. The April 1 forecast predicted natural flows in the Snake Basin to be only 56 percent of normal.

To augment Snake River flows, some water budget storage may be provided from Dworshak reservoir on the North Fork of the Clearwater River. In addition, since the Bonneville Power Administration and the Idaho Power Company have agreed to extend their storage-exchange contract through 1988, additional water budget flows will be provided from Brownlee reservoir on the Snake River.

> "Except for Grand Coulee's, the reservoirs are not expected to refill by July 31, because the natural flows have been worse than the 1928-1929 flows were."

Another major program to aid fish migration may also be affected by the low water. At some dams, water laden with juvenile salmon and steelhead is spilled through spillways — rather than released through the turbine units — diverting the young fish away from the powerhouse during the spring migration. This spill is an interim solution until the dams have bypass systems and screens installed to deflect the fish away from the turbine units. The Council's Columbia River Basin Fish and Wildlife Program calls for enough spill to guarantee that 90 percent of the migrants survive their passage at each dam. In better water years, more spill may be provided. During the 1988 fish passage season, it is unlikely that additional spill, above the minimum 90-percent survival level, will be provided by the Corps of Engineers.

What will happen next year in the river system? The region can only wait and see. Gibson says there is historically a low correlation between water years — only about a 10-percent chance of the dry winter repeating next year. But, because the Northwest typically has low rainfall in the autumn, those who operate the reservoir system won't be able to judge until about November how wet the coming winter will be. Like the river, the region must be "patient to some degree." ■

Illustration by Jerry Kruger

PROTECTED AREAS ISSUE OPEN FOR COMMENT

by Carlotta Collette

The Northwest Power Planning Council has voted unanimously to release for public review a proposal to protect roughly 40,000 river miles of Northwest streams from future hydroelectric development because they are critical to salmon and steelhead as well as nonseagoing fish and wildlife. The move, taken at the Council's April meeting in Missoula, Montana, opens a 70-day period during which the Council will hold public meetings in Idaho, Montana, Oregon and Washington to refine the proposal. For copies of the proposal and additional background information see the order form on the back cover.

The Council will also take written comment through July 8, 1988. A final decision on incorporating the proposal into the Council's Columbia River Basin Fish and Wildlife Program is expected in early autumn.

Background

Substantial losses of fish and wildlife habitat have occurred in the Columbia River Basin and in the region as a whole as a result of hydroelectric development. Dams have blocked passage for migrating fish, flooded both fish and wildlife habitat and caused significant fish mortalities at the dams themselves. Furthermore, disputes over the possible consequences of hydroelectric development add to developer costs and utility rates, and leave the region less certain about its ability to develop new resources quickly, when they are needed.

Six years ago, the Council began a process to identify areas where further development would have substantial and irreversible adverse effects on fish and wildlife. Extensive studies of regional fish and wildlife habitat were conducted from 1984 through 1986, and data bases were developed for anadromous (ocean-migrating) fish, resident (non-seagoing) fish, wildlife and hydropower potential in the region.

Common criteria, modified for each state, were applied to the data to specify critical fish and wildlife habitat for protection from future hydropower development.

In October 1987, the Council released a staff issue paper for public comment, proposing that the Council designate the identified areas for protection from all future hydropower development. More than 400 individuals and organizations responded.

A list of stream reaches proposed for protection has been compiled. In areas where salmon and steelhead and wild resident fish are present, the Council is concerned that any development may involve unacceptable risks of irreparable harm to such fish, their spawning grounds or habitat. In areas where non-wild resident fish or wildlife are present, the Council is proposing that no hydropower development should occur that would result in a net loss of such fish or wildlife.

Effects of Protected Areas Designations

The proposal to designate certain areas of the Pacific Northwest as protected from hydropower development would have its strongest impact through the Council's fish and wildlife program. The current process is expected to result in amendments to the program, which would then influence federal agencies that operate, develop and regulate the hydropower system in the Columbia River Basin. While the Council cannot prohibit development, the Northwest Power Act requires these federal agencies to incorporate the Council's program in their decision making.

The Act requires the Bonneville Power Administration to be "consistent with" the fish and wildlife program and the Council's Northwest Electric Power Plan within the basin. The proposal calls on Bonneville to refrain from acquiring hydropower in protected areas and to deny hydropower development in protected areas access to Bonneville's intertie power transmission system.

Non-federal hydroelectric development falls within the purview of the Federal Energy Regulatory Commission (FERC), which makes licensing decisions on particular hydroelectric project proposals. FERC must take the fish and wildlife program into account at all relevant stages of its decision-making processes "to the fullest extent practicable."

The current proposal would also result in amendments to the Council's Northwest Power Plan. The plan guides Bonneville's resource acquisitions throughout the Pacific Northwest, not just within the basin.

The proposed amendments apply only to new hydropower projects, not to existing dams. A new hydropower project would be a new structure containing hydroelectric facilities for which FERC has not issued a license.

Existing water rights, water appropriations or jurisdiction over water would not be affected by the Council's decision. Nor will the amendments alter, amend, repeal, interpret, modify or conflict with any interstate compact made by the states.

Regionwide, 40,794 river miles would be affected by the proposed amendments (less than 15 percent of the region's river miles). The Council estimates that of 327 hydroelectric projects currently proposed or under study in the Pacific Northwest, 202 would be affected, representing 688 average megawatts of energy. Another 125 projects, representing 800 average megawatts, would be unaffected.

Four processes for changing the designations have been incorporated into the proposal:

1. Areas included on the protected areas list because of incorrect data or other technical errors could be removed from the list through an expedited amendment process;
2. The Council would promptly review its protected areas designations in light of any state comprehensive river plans, river basin plans or watershed plans, especially in view of individual states' special interest in habitat for resident fish and wildlife;
3. The Council could amend the designations upon completion of its system plan for salmon and steelhead in the basin; and
4. The Council's usual program amendment processes could accommodate other changes in the designations, including consideration of an exception for any hydropower project that is shown to have special fish and wildlife benefits. ■

Public Comment on the Proposal

All written comments must be received in the Council's central office, 851 S.W. Sixth Avenue, Suite 1100, Portland, Oregon 97204, by 5 p.m. Pacific time on July 8, 1988. Comments should be submitted to the attention of Dulcy Mahar, director of public involvement. Comments should be clearly marked "Protected Areas Comments."

The Council may hold consultations with interested parties to clarify points made in written comments. In addition, the Council will hold the following public hearings:

Richland, Washington
May 11, 7 p.m.
The Hanford House
Vernita Room
802 George Washington Way

Libby, Montana
May 31, 7-10 p.m.
Lincoln County Community College
Memorial Gym
111 E. Lincoln Blvd.

Coeur d'Alene, Idaho
May 31, 7-10 p.m.
The Coeur d'Alene Resort
Cabin 3

Kalispell, Montana
June 1, 7-10 p.m.
Outlaw Inn
Winchester Room
1701 Highway 93 South

Lewiston, Idaho
June 1, 7-10 p.m.
Lewis-Clark State College
Williams Conference Center
Selway River Room
9th Avenue and 4th Street

Missoula, Montana
June 2, 7-10 p.m.
Village Red Lion Inn
Canyon Room
100 Madison

Idaho Falls, Idaho
June 2, 7-10 p.m.
Littletree Inn
Teton Room
888 N. Holmes Avenue

Boise, Idaho
June 3, 3-5 p.m. and 7-10 p.m.
Red Lion Motor Inn Riverside
Liberty Room
9th and Chinden

Bend, Oregon
June 8, 7 p.m.
The Riverhouse
3075 N. Highway 97

Seattle, Washington
June 15, 3-5 p.m. and 7-9 p.m.
SeaTac Airport
Small Auditorium
Mezzanine Level

Spokane, Washington
June 16, 1 p.m.
Cavanaugh's River Inn
Shoreline B Room
N. 700 Division

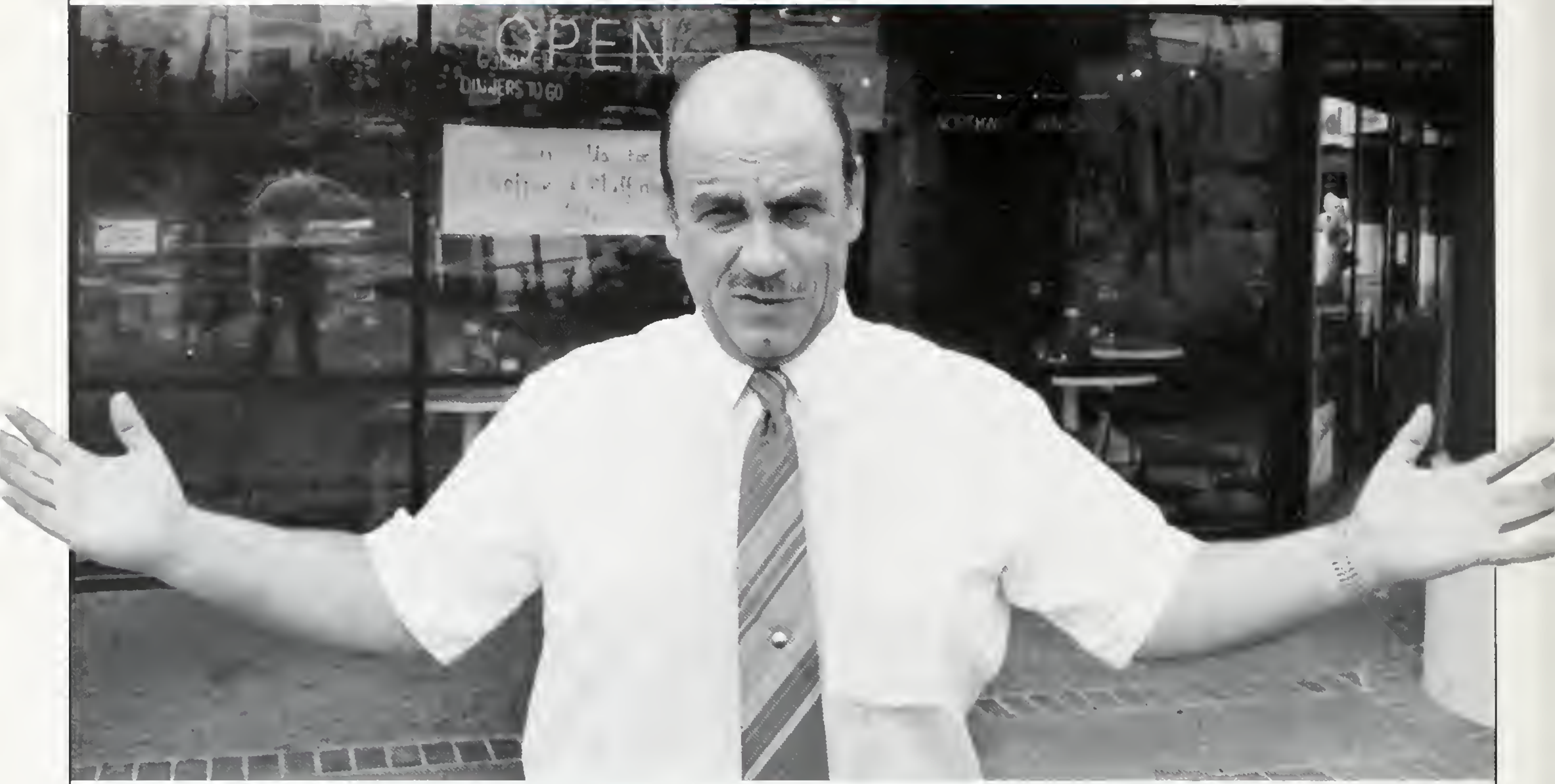
Portland, Oregon
June 22, 7-10 p.m.
Portland Building
Hearing Room
1120 S.W. Fifth

June 23 — 9 a.m.-noon
Northwest Power Planning Council
851 S.W. Sixth
Suite 1100

For questions regarding these hearings or the proposal in general, contact the public involvement division in the Council's central office. (Numbers are listed inside the back cover of this issue.)

To reserve a time to present oral comments at one of the public hearings, contact Ruth Curtis, information coordinator in the public involvement division, at the same numbers. Requests to reserve a time period at a hearing should be received no later than two work days before the hearing.

HE'S HOWARD



OF HOWARD'S GROCERY

by Judy Branham
Portland Energy Conservation, Inc.

Howard Williams of Howard's Grocery has been known to greet his shoppers like a gracious host in a high-class cafe. The image is an appropriate one. The lights in Howard's are subdued; the produce is stacked like bright-colored sculptures; there is none of the glare and noise one generally equates with modern day supermarkets. And yet Howard's, in Beaverton, Oregon, is as modern as a market can get.

That's because the real news at Howard's Grocery is behind the scenes, where innovative conservation devices are projected to save about $52,000 a year in energy costs. Williams' philosophy (about which he is effusive) is simple. "My granddaddy always said, 'If you want to make a dollar, save a dollar. Then when you make that dollar, you've really made two dollars.'" That attitude led to Howard (everyone calls him Howard) fulfilling his dream of building a super-efficient supermarket and winning an "Energy Edge" award for surpassing the Northwest Power Planning Council's model conservation standards for commercial buildings.

"We knew we had a strong contender when Howard's came to us," said Energy Edge Manager Nancy Benner from Portland Energy Conservation, Inc. (PECI). "Howard had installed energy-efficient lamps in his last store seven years ago, before most people had heard of them. His philosophy fit well with the objectives of Energy Edge."

Applicant buildings for the Energy Edge award were required to be at least 30 percent more energy-efficient than the Council's standards. Howard's Grocery was designed to be 39 percent more efficient and, since its opening in October 1987, the store is performing right on target.

Funded by the Bonneville Power Administration, Energy Edge is a Pacific Northwest competition to encourage developers and designers to incorporate highly energy-efficient features in new commercial buildings. It is a research effort in conservation capability building, to develop expertise for full-scale conservation when the region's current power surplus is used up. Through Energy Edge, Bonneville provides building winners with incentive payments for design and construction. Eligible buildings use electricity as the primary

Photographs by Carlotta Collette

source for heating and cooling.

Energy Edge winning buildings will be monitored for three years after they are up and operating. After the monitoring period, actual versus predicted energy savings will be compared, and the added costs of the energy-saving measures will be evaluated.

Four sponsors were chosen by Bonneville to implement the competition. PECI administers Energy Edge in the Portland metropolitan area and has managed the selection and implementation of Howard's Energy Edge design. PECI is a private, non-profit energy conservation firm. Other sponsors are the Oregon Department of Energy, Pacific Power and Light Company and the Washington State Energy Office.

Technical assistance began very early in the project. Staff from the Energy Edge program met with the entire design team for Howard's, including the building's owners at Columbia-Willamette Development Company, engineers, refrigeration experts, architects and electrical engineers. Together they analyzed the interactive nature of potential conservation strategies.

All the players brainstormed conservation measures to beat the model conservation standards. They used a computer model to analyze possible measures and predict costs for each one. Lighting and refrigeration were the two primary energy users in the building, so most of the energy savings come in those two areas.

Williams loves to show off the results of all this analysis — his new 42,500-square foot accomplishment and the energy-saving devices funded by Energy Edge. He mentions the energy-efficient light fixtures, lamps and ballasts. He points out the relaxed shopping atmosphere created by subdued lighting of less than 60 footcandles. "Most stores built now use around 115 footcandles," he notes. "The two most stressful conditions after a hard day at work are bright light and noise. Dark cocktail lounges relax people — not the martinis," he adds, delivering still more of his philosophy.

At Howard's Grocery, innovative conservation devices are projected to save about $52,000 a year in energy costs.

Williams particularly likes to create a special atmosphere. Reduced lighting overhead enhances the spotlighting of grocery displays, a technique Williams has long believed in. Nowhere is the effect more noticeable than in his produce department, where colorful fruits and vegetables are showcased more effectively in black produce cases. "The first time I ordered black cases several years ago, the manufacturer called me personally to make sure I really ordered black," reports Williams. "I told them to mix their paint and when it was as black as it gets, to make it even blacker."

Refrigeration at Howard's Grocery is also state-of-the-art. The system matches power consumption to the required refrigeration load, and a special pressure control allows compressors to operate more efficiently. "The refrigeration improvements alone may save me more than $30,000 a year, because there's also less wear and tear on the equipment," says Williams.

Howard's also relies on reusing what would normally be considered waste heat. Hot gas discharged from refrigeration compressors is used to defrost freezer coils. And heat recovery from the compressors provides heat for the store, as well as for hot water in restrooms and in the meat preparation room.

Other measures funded by Energy Edge at Howard's include energy-efficient motors for evaporative fans and occupancy sensors for lights in offices and walk-in freezers. A central

humidistat controls the operation of refrigeration case anti-condensate heaters.

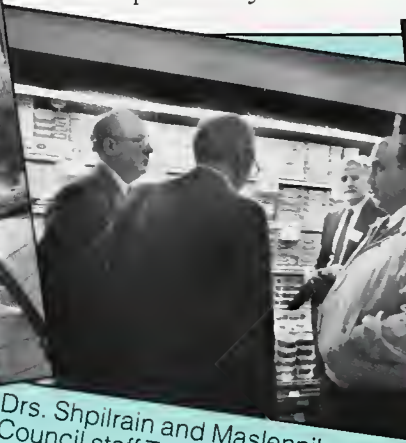
According to United Grocers' engineering department, total energy for a typical store of Howard's size built in the last five years costs about 25 cents a square foot per month. To date, Howard's is performing at 17 cents a square foot.

As can be imagined, Williams is enthusiastic about his energy savings. "In the future, energy will be one of the top two or three cost items in running a business. We'll be able to pass along our savings to our customers with lower prices. That's exciting!"

Besides becoming a kind of local hero in energy-conservation circles, Williams' efforts are being recognized around the world. In 1986, he was named one of the top 10 grocers in the United States. He was featured in a seven-page article in the January edition of Progressive Grocer, an international publication, and he anticipates they will name the new Howard's Grocery "Store of the Year" for 1988. ICA, a chain of 3,500 grocery outlets in Sweden, has asked him to instruct their management on how to save energy and money by improving refrigeration.

It's a new dream for Williams, and he embraces it with all the ebullience he's known for. Howard the grocer is becoming a sort of ambassador at large for commercial conservation. Few things could please him more. ■

Williams greets Oregon Council Member Norma Paulus and Soviet scientists.



Drs. Shpilrain and Maslennikov and Council staff Tom Foley get a lesson in refrigeration from grocer Williams.

Soviets present Howard with a souvenir book about Russia.

Soviet Visitors See Conservation and Capitalism at Howard's Grocery

The fruits of energy conservation at Howard's Grocery in Beaverton, Oregon, were literally a feast for the eyes of three top-level Soviet energy officials touring some of the Northwest's most efficient businesses. The abundance of bright, fresh vegetables and fruits, cases full of choice meats, fish and poultry, a deli with heaping varieties of salads and hot foods, and a tank of live lobsters made an immediate impression at this Energy Edge award-winning store.

"In a country where refrigeration is scarce and people sometimes have to stand in line to buy cabbages, this store would be extraordinary," said Northwest Power Planning Council Member Norma Paulus, who accompanied the Soviets on their tour.

On their visit to conservation projects in the Portland/Vancouver area in March, the Soviets were guests of the Council. The tour is part of a cooperative conservation research effort between the United States and the U.S.S.R. The Soviets visited both residential and commercial buildings designed to meet the Council's model conservation standards for Northwest buildings.

"The Soviet scientists were very impressed with the store," according to Jim Litchfield, the Council's power planning director. "And they were struck by Howard's philosophy as a businessman. Conservation helps reduce his monthly costs and his savings are passed on to customers through lower prices. So he can pursue more profit through being more competitive in the marketplace."

They also found Howard to be a sincere and generous host. He gave them each a bag of groceries as they departed.

"We were very appreciative of the opportunity to see conservation happening," said Dr. E.E. Shpilrain, head of the energy department for the Institute for High Temperature Physics in the Soviet Union. "We were more impressed with what we saw than we thought we would be."

Litchfield explains that the Soviets' have studied and discussed energy efficiency in an effort to meet 30 percent of their future energy needs with conservation. But they still wondered if it was real. "It is real," he said. "In the Northwest, we're making it real by doing it."

—JB

DULCY MAHAR INTERVIEW WITH

MORRIS BRUSETT

Morris Brusett just **seems** *quiet.*

He hadn't been a former governor or legislator or Congressman like some other Northwest Power Planning Council members. He hadn't made waves in energy or fish and wildlife circles, nor had he published important papers. He was perhaps one of the few people in the region who didn't lay claim to having authored the Northwest Power Act. And he certainly wasn't flashy.

But ... in little over a year after his appointment, Brusett had become the Council's vice chairman and chairman of its power committee. The year after that, he was elected to be the Council's sixth chairman.

When Morris Brusett first arrived on the scene, he didn't appear to enjoy the picture he saw. Preliminary votes on some important issues threatened to fractionalize the Council, with an Idaho/Washington versus Montana/Oregon split. The staff, which had been forged under the charismatic leadership of Dan Evans, appeared aloof and not altogether welcoming to the newcomer.

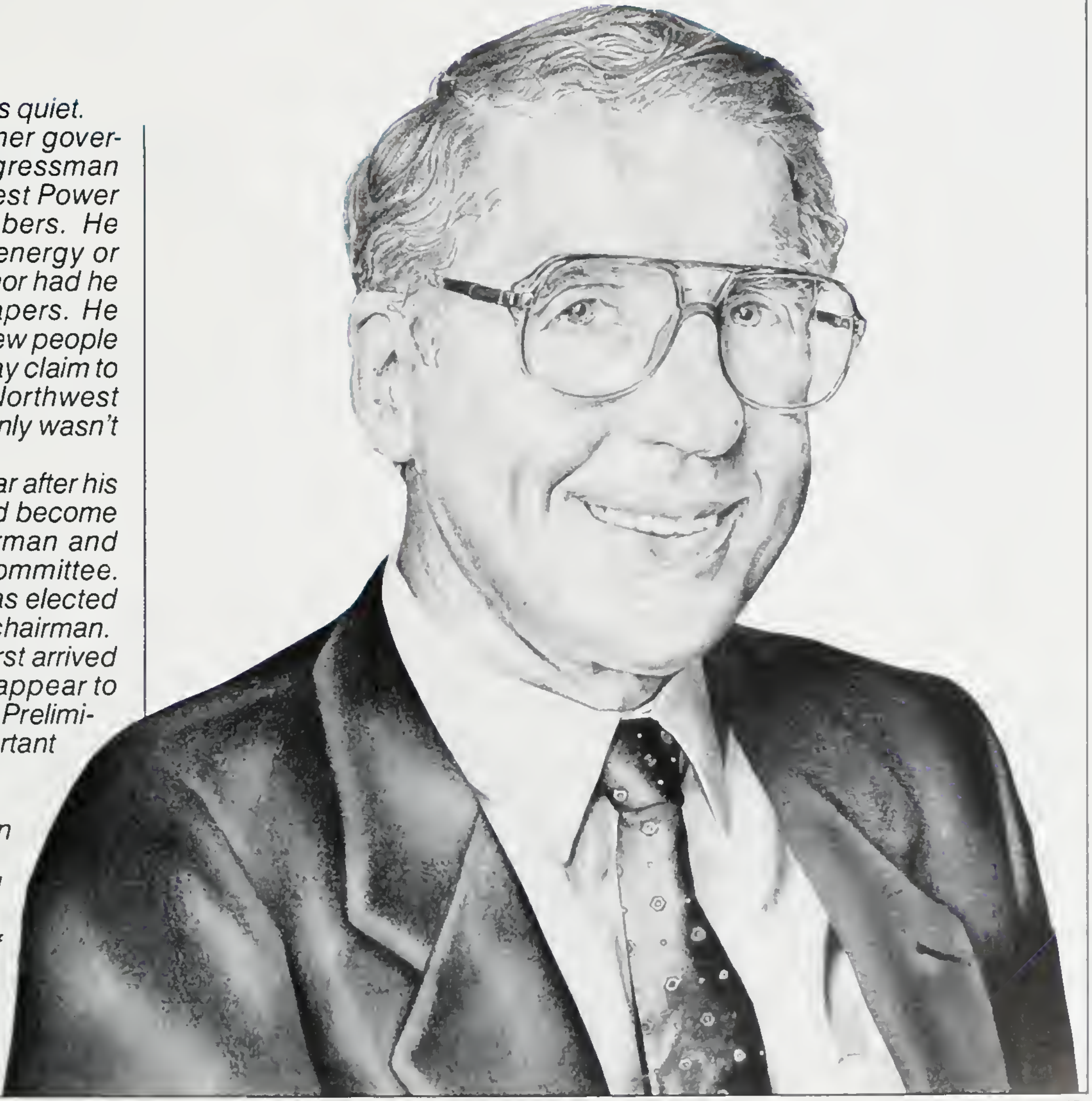


Illustration by Lynn Carson

Debate still reigned about the relevance and future of the Council as a lawsuit sought to render the Council either illegal or impotent. Relations between the Bonneville Power Administration and the Council sometimes were on the testy side.

Brusett was having none of that.

Without eloquent oratory, without prior technical expertise or political clout—in short, without seeming to—Brusett played a major role in changing how the Council works together and how it interacts with others. He has been a man who does things by the book. "If you've got a problem, let's get together and talk it out," is his philosophy. In short, he brought to the Council the one asset few other Council members had had—management experience.

Brusett came to the Council from a position as director of Montana's Department of Administration, where he had supervised the operations of more than 550 employees. As department director, Brusett was also ex officio state treasurer and controller, responsible for Montana's cash management and accounting systems.

A certified public accountant by vocation, Brusett had served 14 years as Montana's first legislative auditor, responsible for conducting financial and program audits for all state agencies. That job was a homecoming for Brusett (his home town of Brusett, Montana bears his family's name) from a position as an auditor for the state of California.

Brusett has a degree in business administration from Walla Walla College and did post-graduate studies at the University of Washington and Loma Linda University. He lives in Helena with his wife Geri.

When Morris Brusett first arrived on the scene, he didn't appear to enjoy the picture he saw.

Q. What changes have you seen in the Council since you've been a member? Obviously, there have been major changes in membership. How has this affected the mix of the Council or the direction? Has the personality or the focus of the Council changed as a result of the turnover?

When I first started with the Council, it seemed as if there was more contention and a confrontational style. Our current Council members work in a more harmonious fashion. It doesn't mean that they're not independent or have strong feelings about particular issues. But, because of their backgrounds, serving in legislatures and in Congress and in other policy-making roles, they do very well in interaction. And so we reach even difficult decisions in a lot more harmonious fashion.

We have some extremely strong Council members. I think that this Council is as strong as any Council, including the era of Dan Evans, because we have had people like

Bob Duncan and Norma Paulus from Oregon. In Washington, with [Ted] Bottiger and [Tom] Trulove, I don't think you could find stronger members than they are. And you can look at Idaho [Bob Saxvik and Jim Goller] too, and say the same. George Turman, Montana's newest Council member, is also highly qualified. He's going to make an outstanding contribution. So I believe we have a really good Council, even though the membership has changed.

Q. How has the Council's relationship with the Bonneville Power Administration changed, or has it changed?

It has changed significantly since I started. Part of that came through the 6(c) process.[1] I think that process — where we sat down with Jim Jura personally and his key staff and worked through things — was the underpinning of a whole new relationship with Bonneville. We have to commend Jura for a lot of that, because he recognizes the role of the Council and the importance of the Council to the region. He recognizes that even though Bonneville and the Council are independent, we both have specific roles, and to be successful we have to work together. So, his attitude played a large part in working out a better relationship.

Also, I believe my predecessors as chairmen played a role in the change in the way that the Council works with Bonneville. Both Bob Saxvik and Bob Duncan were consensus builders and wanted to work with people. That's my style too, to be cooperative and to work out solutions. I think we have a very good relationship, although we still maintain our independence. I think we're going to be a lot more successful, and the region will benefit because of it.

Q. You mentioned the style of Bob Saxvik and Bob Duncan and their ability to forge consensus. You're really the only Council member with management background. How would you describe your style?

The Council is a collegial group whose eight members basically share the authority. Although my background is perhaps different from some of the other members, we all recognize that you have to build a consensus. Being chairman of the Council is not like being a director of a department, where you can say, "This is the way it is." Even that doesn't work anymore in government or business. As a director or a lead person, you have to work with the staff and develop a partnership/ownership, or else you really aren't successful. The old dictatorial style is gone, even in most line agencies.

We all learned a lesson with the early MCS [model conservation standards], when we went out and said, "This is the way it should be," without getting the region to sign up for it. It just didn't work. So we had to go back and rethink the situation and get the region to be a partner with us in developing the MCS. Others had to have ownership in it before they were willing to get behind the standards and get the job done.

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[1] Section 6(c) of the Northwest Power Act calls for the Bonneville Power Administration to submit major resource acquisitions to public and Council review in order to guarantee they are consistent with the Council's power plan. The period referred to was the first major acquisition of a resource (Bonneville's Conservation Modernization Program for the aluminum industry) and first test of the Council's review authority with Bonneville.

Regional cooperation is still an elusive target.

Q. What do you see as the biggest issues ahead for the Council? Let's deal with fish issues first.

In fish and wildlife, we have a new program, a revised program. Now we have to build on that, and I believe it really is a blueprint for the future. One issue facing us this year is subbasin planning. We have to monitor this effort and make sure the results help us determine how we're going to double the fish runs, and how we're going to have integrated planning throughout the basin.

In addition, we're embarking on wildlife mitigation. We've had a number of presentations on mitigation proposals including those for Grand Coulee Dam in Washington, the Willamette plan in Oregon, and plans for several Idaho projects. We're in the process of developing an overall wildlife mitigation plan for the region. We did complete one for Hungry Horse and Libby dams in Montana.

I believe completing the bypass systems of the mainstem Columbia River dams is also critically important. Bob Duncan did a yeoman's job taking the lead in this area and working with Congress to secure funds. The region has agreed that we need to get these bypass facilities in place. Now we need to make sure the [U.S. Army] Corps of Engineers funds these projects through to their completion. We're continuing to work with Congress to see this happens. We need to do it, because it doesn't make sense to continue to spill water. It's too costly to the region.

Of course, another key issue is protected areas. We had a staff proposal out on the street for several months, and we heard a great deal of public comment. We're now in the phase of seeking comment on a proposed amendment to our fish and wildlife program. I would expect that, whatever the final decision is, we're still going to make sure we achieve our overall goals of protecting the ratepayers' investment in our fish and wildlife, and at the same time send signals to both potential developers and FERC [Federal Energy Regulatory Commission] that we intend to protect the resource.

Q. What about the major power issues ahead?

Our major work in power now is the power plan update. It is our top priority. Even though we have a 20-year plan, and we have our so-called "jaws forecast"—the range that provides for high or low growth, unless our plan is timely, it won't be credible. We can't have a perception that the plan is not current. By having updates, it sends a signal that the plan is timely, that we've responded to a changing environment, and that it's still relevant for the future.

Staying current is important because we're the premier planners for the region. We're independent; we represent our individual state governments; and we have a vehicle for building regional consensus. The region is looking to us for leadership in this area.

The power plan update is also important from the standpoint of the diminishing surplus. People wonder how that's going to affect the region. We've basically completed our Western Electricity Study, so we'll be able to integrate the results of that study into the plan. It will also be our first opportunity to tie in our planning to Bonneville's resource program. We've been working this year to interface our plan and Bonneville's resource strategy to avoid all the confusion, duplication and all the extra work that was involved in participating in two processes.

Another priority will be the model conservation standards. It seems as if we're always involved with the standards. When I started with the Council, that was the first order of business, and we're still right in the middle of it.

It's important that we set the stage for the future. Right now we have in place what's going to happen up to the end of 1988. But what's the long-term plan for MCS? How's it going to work? What's everybody's role? We have to make those decisions now so that we don't have any uncertainty.

Finally, I think a continuing issue will be regional cooperation. To be honest, this is still an elusive target. The Council's going to have to be more creative and pay greater attention to it. There are tremendous benefits from cooperation, and somehow we have to try to capture those benefits. I believe the Council is a unique agency and one that can provide the leadership to bring about regional cooperation. We just haven't done it yet. We need to do a lot more in that area, and that's something we have to look seriously at again this year.

Q. What has been your biggest disappointment in the Council, if any?

I don't think there's really been any big disappointment. It's more of a learning process for me and a recognition that consensus building and progress takes time.

I suppose that when I first started, I was a little impatient about getting results, particularly in the area of MCS and some of the other issues that we had reviewed and talked about for a long time. As a director of a department in Governor [Ted] Schwinden's administration, I could bring about results a little faster than you can with a region. With four states, we have a lot of different people and a lot of different interests. We have east/west, urban/rural, public/private—all these considerations. It's not a disappointment to work this way, but it's a realization on my part that it takes time, and you have to spend a lot of time getting everybody involved. So, it's a little slower process, perhaps, than I was used to, but I'm comfortable with that now.

Q. What part of the Council's work do you enjoy the most?

When I first started, I concentrated on power issues. I'm still on the power committee, but over the last year or two, I've spent a lot of time with the fish committee. Actually, I find both fish and power issues exciting. The more I get into the issues, the more challenging I find them. I'm also starting to see some results, long-term results.

Being part of a process with such huge ramifications is a tremendous challenge, which makes it exciting. I really like the overall job now more than ever in the past three years.

Being chairman has been a tremendous challenge, too. I've been in a leadership role for a long time in my life, and I like that role. I feel like I can play a major part in getting things done, and I'm frustrated when things don't get done. I'm results-oriented when it comes to issues. The chairmanship has given me more of an opportunity to focus the Council and concentrate on specific areas.

Q. You've said this might be your last year because of the change in governors. Do you anticipate there's any possibility you'll stay on?

Well, in Montana as in the other states, these positions, of course, are gubernatorial appointments. The history has been that a new governor would appoint somebody who's close to him and had worked with him. Since Governor Schwinden is leaving, I don't have that relationship with any of the candidates at this point. So I expect that I'll be leaving. I have to admit that at one time, I didn't think that would be so bad because of the tremendous time commitment required to be an effective Council member.

Being part of a process with such huge ramifications is a tremendous challenge.

I think this is the toughest job I've ever had in terms of what I have had to learn, in terms of the multitude of issues and the magnitude of goals and all the elements that go behind each of the issues. It's challenging now, but at first it felt real frustrating because I wondered if I'd ever capture all the relevant data and get up to speed on the issues. In addition, there's the travel time. It takes a tremendous amount of travel time coming from Montana. I would say, about two-thirds of my time is spent away from the Montana office. I'm always on the road or in the air to Portland or Seattle or Boise or somewhere else.

But even though there are the downsides, the upside is that I'm enjoying my job now more than ever. I'm comfortable with the issues. I think I understand them. I'm seeing progress. And we have such a good group to work with. In case you don't ask the question, I want to add that we have the most outstanding staff that I've ever been connected with. At first I wasn't so sure, to be honest with you, because of some of the frustrations of the model conservation standards and some of the interactions that went on between staff and Council. But now I'm very comfortable with our staff, and I just think our people are outstanding.

I know I will miss the friendships and closeness that have developed among the Council. You can't go through difficult problems like we have and work your way through them without building a certain comradery. When you leave something like that, it's something you're going to miss.

Q. What's prevented that classic east/west split that seems to affect all other political bodies in this region?

Well, I'm not sure what happened before my time, but I think what you say is correct. We have not had an east/west split. In fact,

we've had more of an Oregon/ Montana coalition and an Idaho/ Washington coalition. But I think that's basically a result of personalities, and that's pretty much behind us now. The Council members recognize the regionality of our organization. Individual members have definite views, but they also recognize that we're a region and, for the most part, will try to end up with a product that recognizes state differences, but that's still good for the region as a whole.

Q. Over the years, there's been debate in the region about whether the Council is a regulatory agency, at one extreme, or if we're simply advisory, at the other extreme. What do you see as the classic role of the Council?

Of course our major and most obvious role is that of a premier planner. We are independent, and I think that we now have the recognition in the region that our planning capabilities, our fish and wildlife program and our power plan, are all top quality products.

You could characterize our role as that of a crucible for new ideas.

It's important that we continue to focus on our role as planner. I think that we should be *the* planner. That's why I've strongly supported efforts to work with Bonneville to avoid duplication, so it's clear that we're the planner and they are the program implementor.

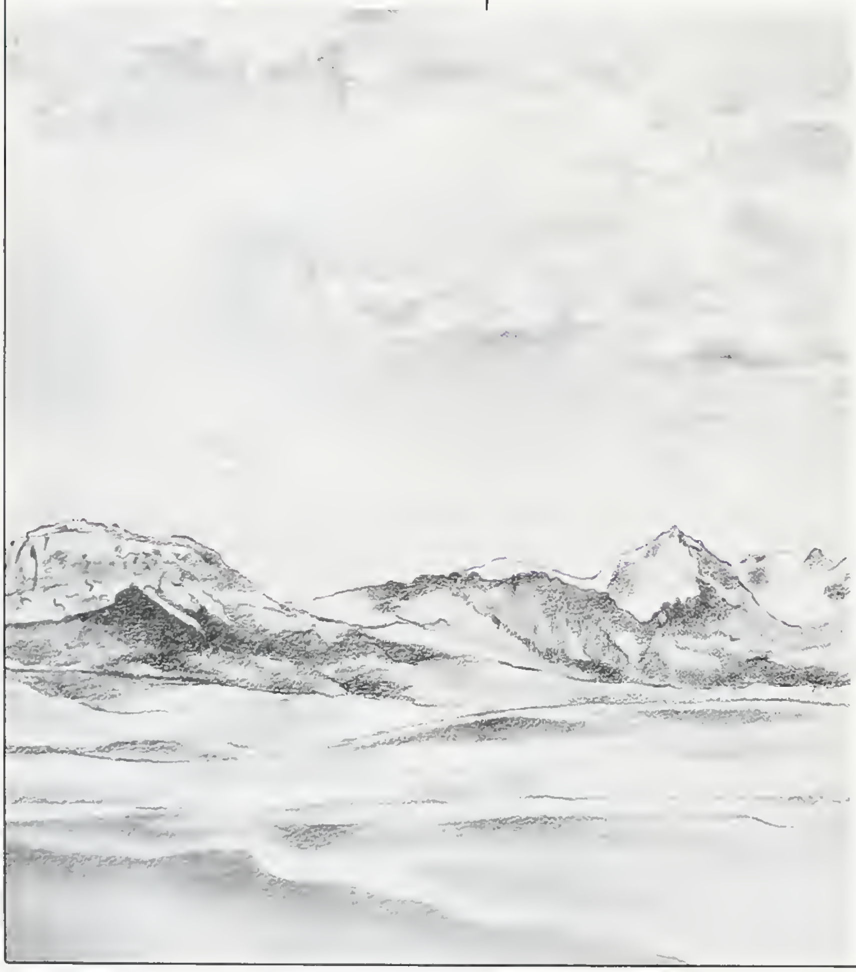
Planning, no matter how good, is not enough. You also have to see results in terms of implementation. It doesn't do you a lot of good to plan if nothing is ever accomplished. The Council has a role in monitoring and oversight of implementation. But, we're not a regulator—that's not our role.

It seems to me that we also bring to the region another less obvious role. I guess you could characterize it as a crucible for new ideas, a medium for interaction in the region, and then finally, a forum for consensus building. You can have the best plan, but unless you can bring the region with you, and the regional parties believe what we're doing makes sense, it's not going to be implemented.

I also see us playing a role in ensuring stability in the region. Right now, you have Bonneville concerned about revenues, and the investor-owned and public utilities are also concerned about revenues. There's a tendency to let the big picture drift because of short-term needs. And they are real needs too. I think we're kind of the rudder that say's, "Wait a minute, let's not forget what's best for the region in the long term. Let's protect the regional interest and make sure we have the least-cost resources for the future." The Council has to serve as kind of the stabilizing factor so that we don't deviate too far from our long-term regional plan because of short-term situations.

I believe the Council is now firmly entrenched as an institution in this region. At one time there was a lot of discussion and supposed turf fighting between us and Bonneville. But that's behind us and we're established as a planning body. We're also established as the institution that's going to get the corrections made for past wrongs to fish and wildlife because our program is the region's program to get the job done. We're going to reinforce that our power plan is the regional plan now, as we finish our update and ensure that it is timely and relevant.

It was interesting to me to hear recently that New England and other parts of the country are looking at a similar institution or even considering contracting with us to do their planning. It does say something about the recognition and significance of a regional body like ours. I think that means we've been successful. ■



BRINGING UP THE BOTTOM LINE

by Carlotta Collette

It's an easy shift of numbers on a page to move the cost of lighting, heating and cooling commercial enterprises from the expenses column to the earnings column. It stands to reason that money saved from the cost of running a business generally makes its way down to the bottom line.

But cutting operating costs in the commercial sector is a far more complex process than, say, saving energy in houses. In the residential sector, the range of building shapes and sizes, uses and characteristics, and the influence of climate can be easily analyzed. Building codes can prescribe levels of insulation and design modifications that will save reasonably predictable amounts of energy. Few efforts beyond rigorous codes such as the Northwest Energy Code, which is based on the Northwest Power Planning Council's model conservation standards, can save significant amounts of additional energy at a reasonable cost.

In the commercial sector, however, the calculations become more intricate. The amount of energy used by any given enterprise is as likely to be influenced by the nature of the business as by the structure that houses it. Office complexes with banks of computers, for example, will have different requirements for energy than will restaurants or department stores. Consequently, determining the most efficient ways to run very different sorts of companies calls for more tailoring of conservation efforts than does residential conservation. Building codes that require efficient structures and equipment only go part of the way to recovering all of the savings that are cost-effective.

So the Council, in developing its model conservation standards for commercial buildings, looked at both building codes to establish a base level of conservation, and programs that encourage more inventive approaches to saving energy beyond the code-imposed level.

In its 1986 Northwest Power Plan, the Council estimated that the region could save more than 500 average megawatts over the next 20 years by gaining region-wide acceptance of the model conservation standards in the commercial sector. This is equivalent to the energy produced by a medium-sized coal plant at an estimated cost of about 2.5 cents

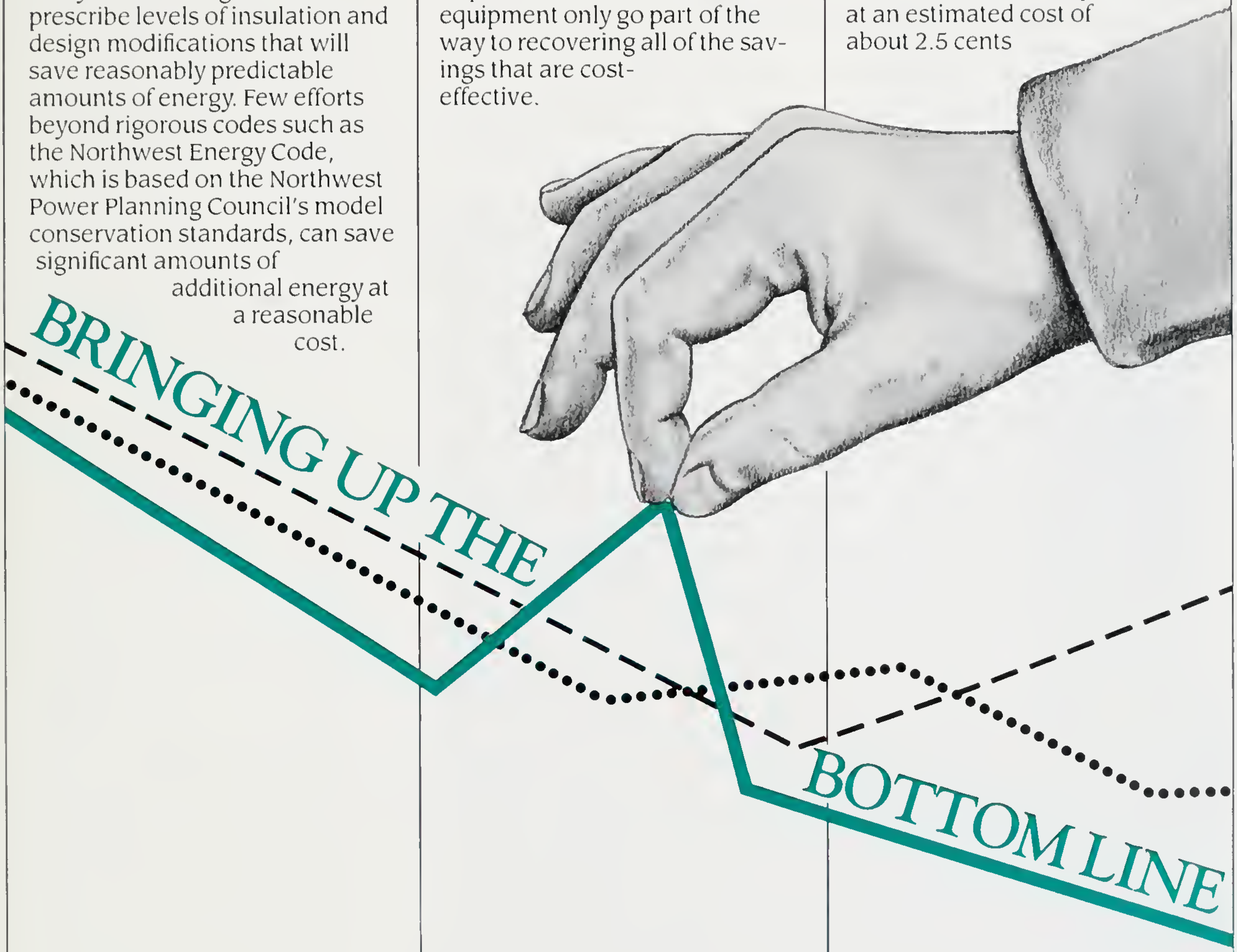


Illustration by Lynn Carson

per kilowatt-hour or half the cost of the coal plant.

The plan treated the additional energy savings that could be secured by going beyond the standards as a "promising resource," and it encouraged the Bonneville Power Administration to support programs promoting new commercial construction that betters the codes by as much as 30 percent. Bonneville's "Energy Edge," described elsewhere in this issue, is one such program.

Finding a Better Building Code

The 1986 Power Plan also called for a review of the standards to determine whether they still capture all the savings that are cost-effective. When the standards were first developed in 1983, they reflected a near consensus among members of the engineering and building community. These standards were based on Standard 90A-1980 of the American Society of Heating, Refrigerating and Air-conditioning Engineers (ASHRAE), a standard that served as the model for most states' (including the four Northwest states) commercial building efficiency codes.

Building codes that require efficient structures and equipment only go part of the way to recovering all of the savings that are cost-effective.

In the years since 1983, there have been tremendous advances in lighting efficiency and in energy management systems for operating many different sorts of businesses. Both Oregon and Washington have adopted new commercial building codes with more stringent guidelines to reflect the changing technology. In addition, the U.S. Department of Energy and ASHRAE are both developing new, more stringent nationwide standards which will, when adopted, surpass the energy savings of the Council's standards.

These activities indicate that there are cost-effective energy savings in the commercial sector not included in the Council's standards. Since the Council is required by the Northwest Power Act to garner all power savings that are cost-effective to the region and economically feasible to consumers, a review and probable revision of the commercial standards is in order.

This review began in 1987. Council staff compared the existing model conservation standards for commercial buildings with the new Oregon and Washington state codes, and the proposed Department of Energy and ASHRAE codes. Such a comparison has not been easy, because no single set of codes consistently surpasses existing codes.

For example, the proposed Department of Energy and ASHRAE standards offer builders and local communities more flexibility with more alternatives to select from in meeting the codes. For certain building types, they offer more efficiency with negligible price impacts over either the existing Council standards or the Oregon and Washington codes. But the Council's existing standards and the Oregon and Washington codes require more efficient lighting than the proposed ASHRAE code, while the Department of Energy's proposed code for lighting is roughly equivalent to the tougher standards.

Photo copyright, Seattle Times Co.

In addition, the two proposed standards cover some energy-related features and equipment not addressed in any existing Northwest codes. They have generally more stringent requirements for making the shells of structures (called the "envelope") more conserving, using more efficient equipment, and incorporating energy-use monitoring and management systems in new commercial buildings. However, neither proposed code is expected to be adopted until this fall.

Pending their adoption, the Council is interested in public comment on which of the code options or which combination of measures should be integrated into the model conservation standards. An option being considered by the Council would be to adopt the new ASHRAE standard when it is finally approved, but modified with the more efficient lighting standard already in place in the Northwest. Since existing ASHRAE standards are the basis for most state and local building codes in the region, building code officials would have few problems adapting to the updated version. This is not the case with the Department of Energy standard.

An issue paper covering the Council staff technical and economic comparisons of the codes is available from the Council's central office. (See order form on back cover.)

Beyond the Codes: Still More Savings

In studying building codes for commercial construction, Council staff found that even where efficiency codes have been adopted projected energy savings levels are not being met. This is largely due to institutional problems and financial constraints. Inadequate training for code officials, designers, builders and program administrators has limited their ability to enforce existing codes, let alone go beyond the codes to other equally cost-effective improvements.

Most of the regional impetus has been in support of residential conservation programs. While some utilities have offered assistance to builders of new commercial structures, no regionwide program exists to acquire all regionally cost-effective conservation savings in the commercial sector.

Designers and others in the construction industry also have difficulty keeping up with changing technology. In Oregon, the Portland General Electric Company operates its Energy Resource Center to help designers and engineers track technical advances. And in Seattle, a commercial lighting laboratory, sponsored by the Bonneville Power Administration in cooperation with Seattle City Light and the Natural Resources Defense Council, will provide opportunities to test various lighting alternatives to serve specific tasks and facilities. But neither of these will serve the regional clearinghouse role needed to provide special training, maintain a library of design and product information, and assist designers and engineers with computer models and other design aids.

Furthermore, the only research program demonstrating advanced energy-efficient design and construction techniques for new and remodeled commercial buildings, Bonneville's Energy Edge program, is scheduled to end after 29 buildings are built and monitored.

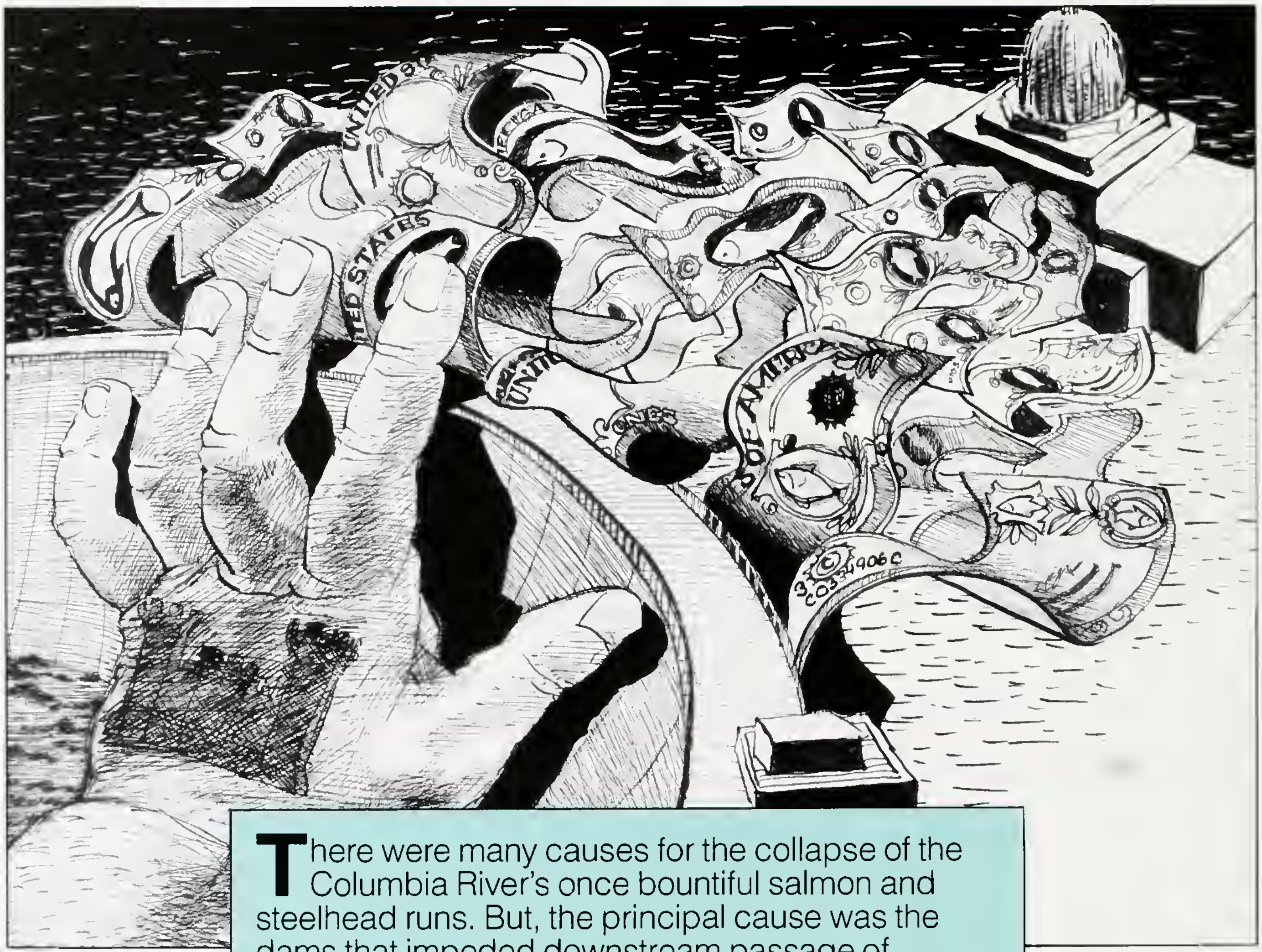
The Council is considering entering rulemaking procedures to amend its power plan to incorporate programs that can support both the regionwide adoption of energy conserving codes for commercial buildings and technical and financial assistance to help designers and engineers go beyond the codes to build even more efficient businesses. Among the programs being considered are the following:

- Energy code adoption and enforcement support (both technical and financial) for local governments and utilities to encourage the adoption and implementation of more efficient building codes for new commercial construction;
- Energy code training to familiarize architects, engineers, designers, builders, code enforcement officials and other developers of new commercial buildings with alternative ways to comply with the codes;
- Similar assistance to enable local governments and utilities to pass even more efficient building codes than those that meet the regional standard;
- Design assistance and awards to encourage new commercial construction that captures all regionally cost-effective conservation savings;
- A regional clearinghouse to publicize new technologies and distribute the findings of research and demonstration programs, as well as coordinate educational opportunities; and
- An ongoing research program to demonstrate, evaluate and encourage application of energy-efficient technologies that are commercially available but not yet widely used.

If the Council does enter rulemaking to incorporate changes in the commercial standards into the Northwest Power Plan, hearings will be held in each Northwest state to take public comment and refine the standards and proposed programs. ■

CORPS DAMS FLOW OF FISH FUNDS

by Steve Crow



Illustraton by Frederika Spillman

There were many causes for the collapse of the Columbia River's once bountiful salmon and steelhead runs. But, the principal cause was the dams that impeded downstream passage of juveniles (called "smolts") trying to reach the sea, as well as adults fighting their way upstream to spawn. By the late 1950s, the Columbia River was on its way to becoming the most heavily developed waterway in America.

In 1959, the impact of development on the fish runs led Oregon Senator Richard Neuberger to remark that "... these magnificent hordes [are] thinned to a few stragglers." By 1973, when the last federal dam was built, the salmon catch was down nearly 80 percent from harvests prior to the completion of Bonneville Dam. By 1980, the Pacific Northwest was perilously close to losing the Columbia River salmon. Some runs had been considered for classification as endangered species.

Development of the dams and hydroelectric projects created impediments to passage of fish and also greatly altered natural flows in the Columbia River Basin. The spring runoff is stored in reservoirs and used later in the year to produce electricity. This reduces and slows natural river flows at a time when juvenile salmon and steelhead are migrating downstream to the ocean. Slower travel time to the sea increases the risks for these young fish.

In the past, efforts to protect and rebuild the fish runs were always marked by controversy. In recent years, shrill and unproductive conflict has been replaced in part by compromise and conciliation.

Moreover, research shows that many juvenile salmon and steelhead are killed or seriously injured when they are drawn through the dams' power turbines. Fisheries authorities estimate that, on average, 15 percent of all fish passing through the turbines are killed. Because fish go through a number of dams, there is a significant cumulative loss. On the mainstem of the Columbia River, of 100 fish passing the nine dams along the migration route, at least 50 will be killed at the dams.

In the past, efforts to protect and rebuild some of the fish runs on the Columbia were only marginally successful and always marked by controversy. Deep-seated animosities persisted among conflicting interests: fisheries agencies, Indian tribes, commercial fishermen, and the operators of the dams that have so changed the fish's traditional home.

In recent years, however, shrill and unproductive conflict has been replaced in part by compromise and conciliation. The divergent interests are actually working together to save the fisheries resource. The beneficiaries of this new cooperation are the Northwest's prized salmon and steelhead.

Over the last five years, the Pacific Northwest has taken major steps toward addressing the particular problem of downstream passage of juvenile fish. The Northwest Power Planning Council's Columbia River Basin Fish and Wildlife Program emphasizes a four-part strategy for improving the survival of young fish attempting to migrate past dams on the Columbia and Snake rivers. First, to speed the young fish through the system of reservoirs, a block of water is released in the spring when the dams would normally store the water to generate electricity later in the year. This "water budget" creates an artificial freshet to imitate the one young fish used to ride before the dams were built.

The more difficult challenge is to move the fish through or around the dam structure itself. To accomplish this task, permanent bypass systems need to be installed at the dams to divert young fish from the turbines. Until these bypass systems are installed and successfully operated, spills of water over the dams rather than through the turbines must be used to flush smolts through the system. The interim spill solution, however, can be quite expensive to the region because of the foregone hydroelectric generation and its associated loss of power revenues. Finally, the other method for downstream passage, which works for certain stocks of fish, uses facilities to collect and transport the fish around the dams in barges and trucks.

While all of these techniques are useful in certain situations, the only permanent, long-term solution for downstream passage is to plan, design and install bypass systems at all the mainstem dams as soon as possible. These bypass systems use submersible screens that deflect the fish from the turbines and into a bypass channel that deposits them below the dam. The Council estimates that these bypass systems will cut turbine mortality in half, thus increasing the survival rate of young migrating salmon and steelhead. Right now, the bypass facilities vary from dam to dam. Some are considered state-of-the-art. Others are obsolete. Still other dams have no bypass facilities at all.

The overall strategy for improving mainstem dam passage is supported strongly in the region. A broad basinwide consensus has developed among the Council, state fish and wildlife agencies, Indian tribes, the Bonneville Power Administration, and private and public utilities in the region. Everyone agrees to support the installation of new or improved screens and bypass facilities at all mainstem federal dams as soon as possible.

In early 1987, this regional coalition agreed to an accelerated bypass development and installation schedule at the mainstem dams. The schedule called for completion of all bypass facilities by 1994. Meeting this expedited schedule, however, depended upon increases in federal appropriated funds directed to the U.S. Army Corps of Engineers. These appropriations will be repaid by the region's ratepayers as a part of the hydropower projects.

The only permanent solution for downstream passage of salmon is to plan, design and install bypass systems at all the mainstem dams.

The U.S. Congress, in both 1987 and 1988, added the necessary funds for these fish bypass projects to the federal budget. In fiscal year 1988, Congress added $8.7 million for fish passage activities at five dams: Little Goose, Lower Granite, Lower Monumental, Ice Harbor and The Dalles. Legislative report language explained in detail how Congress wanted the funds to be spent. In addition, Congress expressed its support for the fish bypass program and instructed the Corps of Engineers to place a higher priority in their own budget process on these important activities.

The Corps has responded to the region's support and this clear congressional intent by withholding current year funds for bypass and by not requesting any follow-up funding for these programs in fiscal year 1989. As a consequence, the accelerated schedule for bypass improvements cannot be met. The schedule has slipped by about three years. "This delay will result in more damage to fish, increased construction expenses, and a more costly spill program for the region," says Ed Sheets, the Council's executive director.

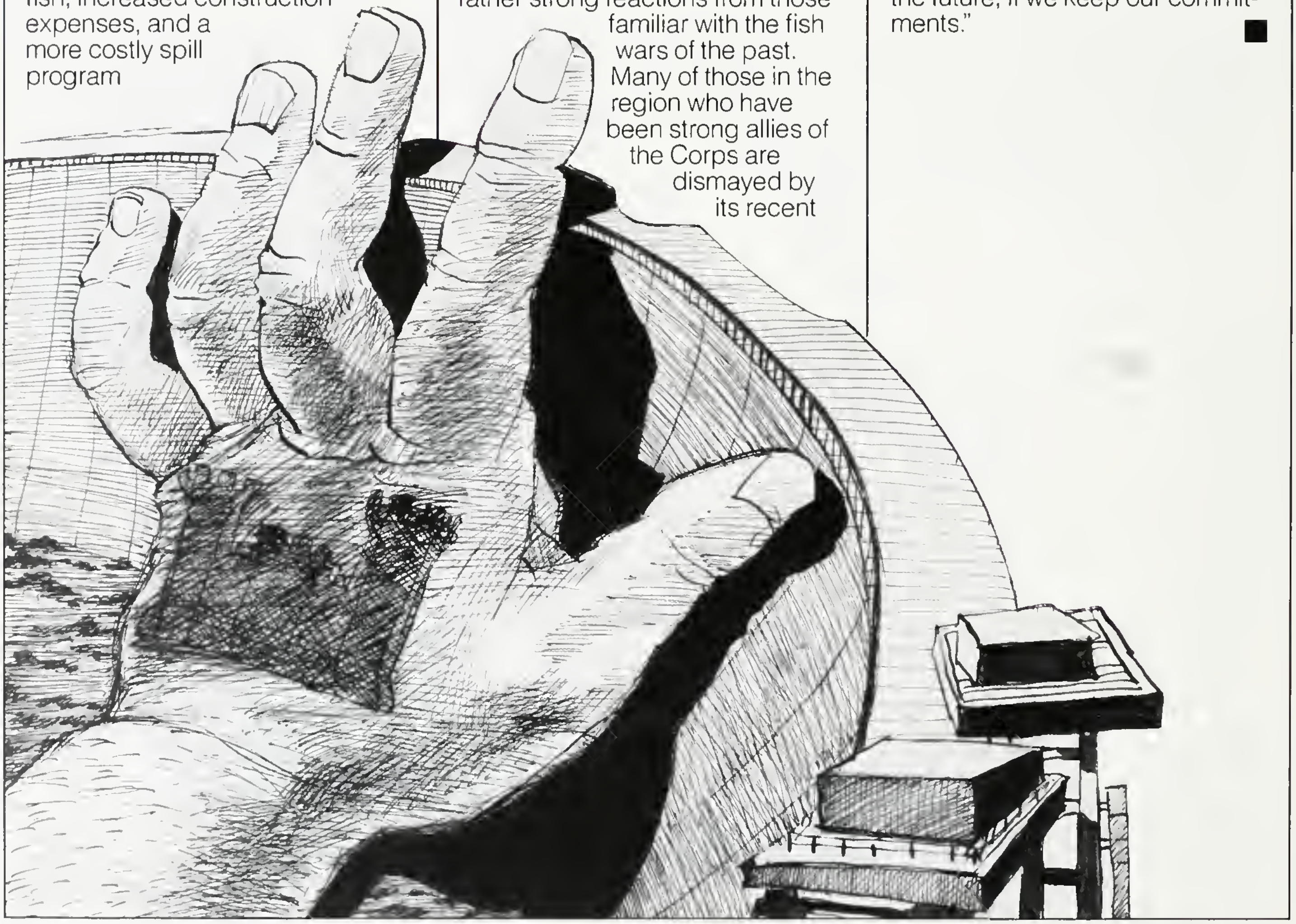
Even more disappointing, according to Sheets, is the fact that the funds are being withheld pending a million dollar study on whether bypass should be funded. "I'm particularly upset that the Corps would waste a million dollars and a lot of time on issues that have already been decided," said Bob Saxvik, chairman of the Council's fish and wildlife committee.

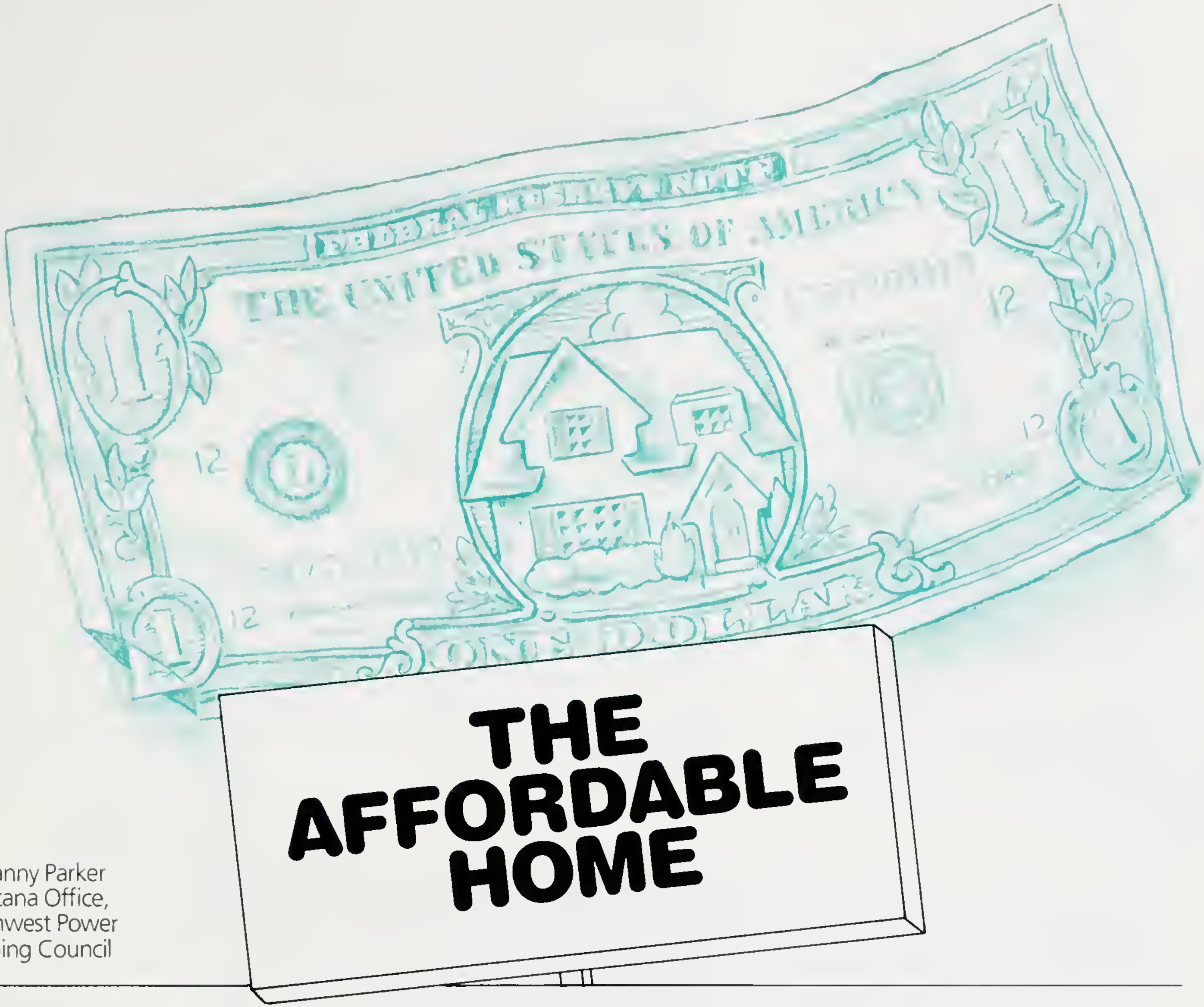
The Corps has dammed up the flow of fiscal 1988 appropriations apparently in order to conduct a further policy review at its headquarters in Washington, D.C. The report, which is now under review in Washington, was originally submitted to headquarters from the Corps' North Pacific Division a year ago. It has been under review since then, but has not been available for comment or analysis by those in the region who developed the fish bypass program.

The Corps' refusal to spend fish bypass funds has drawn some rather strong reactions from those familiar with the fish wars of the past. Many of those in the region who have been strong allies of the Corps are dismayed by its recent actions. Idaho Senator James McClure reportedly told Corps officials that " ... it gets disturbing when Congress takes action on something like this and you say you're not going to honor it, ... you're going to get into a war that neither one of us wants to get into."

Sheets adds, "During a period of cooperation in the region, it is unfortunate that a federal agency has cornered its friends into speaking in terms of war again. The region needs cooperation. Burdening the constructive efforts of the fish and wildlife program with the baggage of procedural delays is inexcusable."

As Oregon Senator Mark Hatfield observed last summer at the Bonneville Power Administration's 50-year anniversary, "[let this region] be a ladder to the spawning ground of a national commitment to protect and enhance fisheries ... the investments in the Columbia River's fisheries are beginning to pay a handsome dividend that promises only greater growth in the future, if we keep our commitments." ■




THE UNITED STATES OF AMERICA
ONE DOLLAR

THE AFFORDABLE HOME

by Danny Parker
Montana Office,
Northwest Power
Planning Council

As almost anyone who has tried to finance a new home knows, when you apply for a loan the two most important factors are the price of the house and your personal income. A lending officer will consider what fraction of your monthly income is available to be spent on the mortgage. Usually this "debt-to-income ratio" is about 30 percent, meaning you may spend up to a third of your monthly gross income on the loan. In the simplest terms, this sets the ceiling on the maximum cost of the house that you may qualify for at a given income level and financing rate.

What most people don't know is that most lending officers also consider a number of other expenses that might affect a homeowner's ability to repay the loan. One of these is the monthly utility bill. Money being spent on space heat, hot water and appliance electricity is money not available to spend on the mortgage.

Until recently, most lenders estimated this expense by taking a survey of typical bills from local utilities and making up an expected cost schedule, keyed against the square-footage of the house. These schedules have typically been developed by local offices of the U.S. Department of Housing and Urban Development (HUD). At best, the current method does a crude job of estimating utility expenses. Widely varying utility rates, the costs for different fuels and the level of energy efficiency of the houses have not been accounted for in the HUD process.

Illustration by Reed Darmon

For example, when the Northwest Power Planning Council developed model conservation standards for new electrically heated buildings, construction practices in the Northwest began to change. New homes built to the Council's standards require less than half the electricity for space heat than conventional electrically heated homes. Electric heat can be a sizable portion of any household's monthly expenses, but the HUD process did not account for these savings.

The problem has been convincing lenders that the predicted energy savings would actually appear in the form of lower electrical bills. Lenders needed some form of tangible evidence and a simple process, comparable to the one they are used to, before they would change their lending practices.

Well, change is taking place. There are enough results in now from monitored homes built to the model conservation standards that savings from these homes can be estimated with a high degree of confidence. Moreover, the monitoring has shown just how much more affordable these very energy-efficient houses are, when compared to homes built to current practice.

These monitored results show significant differences in the average monthly utility bills for three different house types. Figure 1 shows these differences in average annual space heating. The model standards house uses less than half of the electricity for space heat than a house built in 1978, and 40 percent less space heat than a house built to current building practice. Thus, a 2,000-square-foot model standards house will have monthly utility bills that are typically $20 less than a current practice house, when heated with electricity at 4.5 cents per kilowatt-hour (see Figure 2).

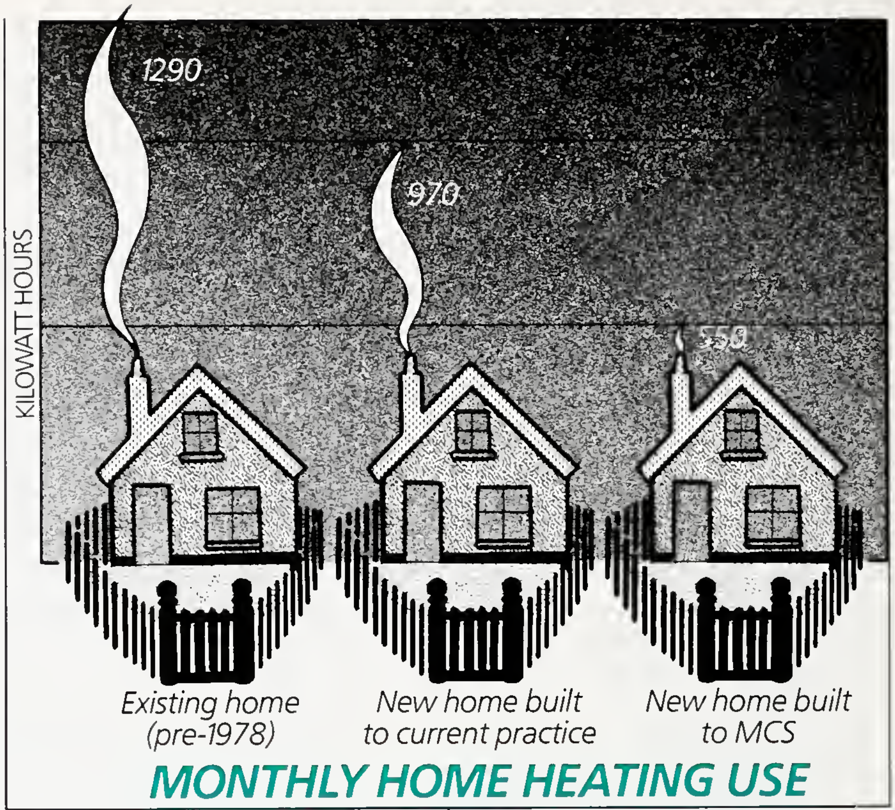
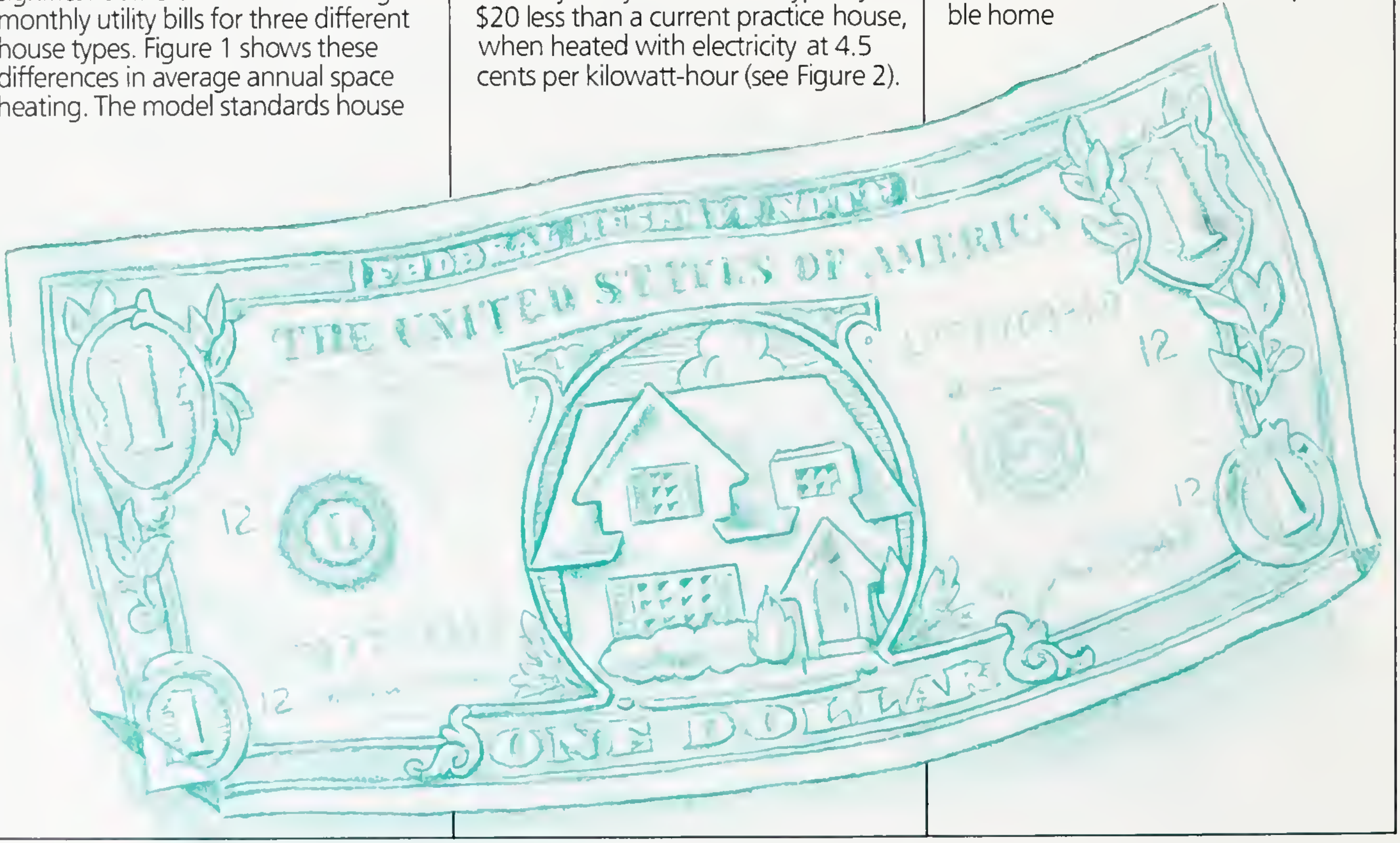


Figure 1

While $20 per month may not sound like much of a savings, it can make a big difference. If the $20 savings in utility costs are allocated directly to the mortgage, a homebuyer can qualify for a house that costs $2,000 more than a comparable home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(assuming the loan carries a fixed interest rate of 10.5 percent, over 30 years). Factoring in these savings allows lending institutions to make more informed loan decisions, while at the same time helping to encourage energy-efficient housing in the Pacific Northwest.

But coming up with better numbers for the energy savings of energy-efficient housing was only part of the solution to lenders' problems. Lenders also wanted new loan application forms that are as easy to use as their current ones. These forms had to be able to handle fuel types other than electricity, such as fuel oil, natural gas and propane.

To develop these forms, the Council used data collected in 1987 as part of a comparison of heating costs using various fuels. The computed results from that study were then compared with data supplied by Northwest Natural Gas and the Montana Power Company, to make sure the numbers were reasonable. They were within 10 percent of the averages provided.

In addition, to ensure that the forms reflect true market conditions in different parts of the region, the Council tailor-made schedules for each fuel type and each individual county within a state. These county-specific schedules take into account local fuel prices. The schedules will be updated each year to ensure they remain current with changing fuel prices.

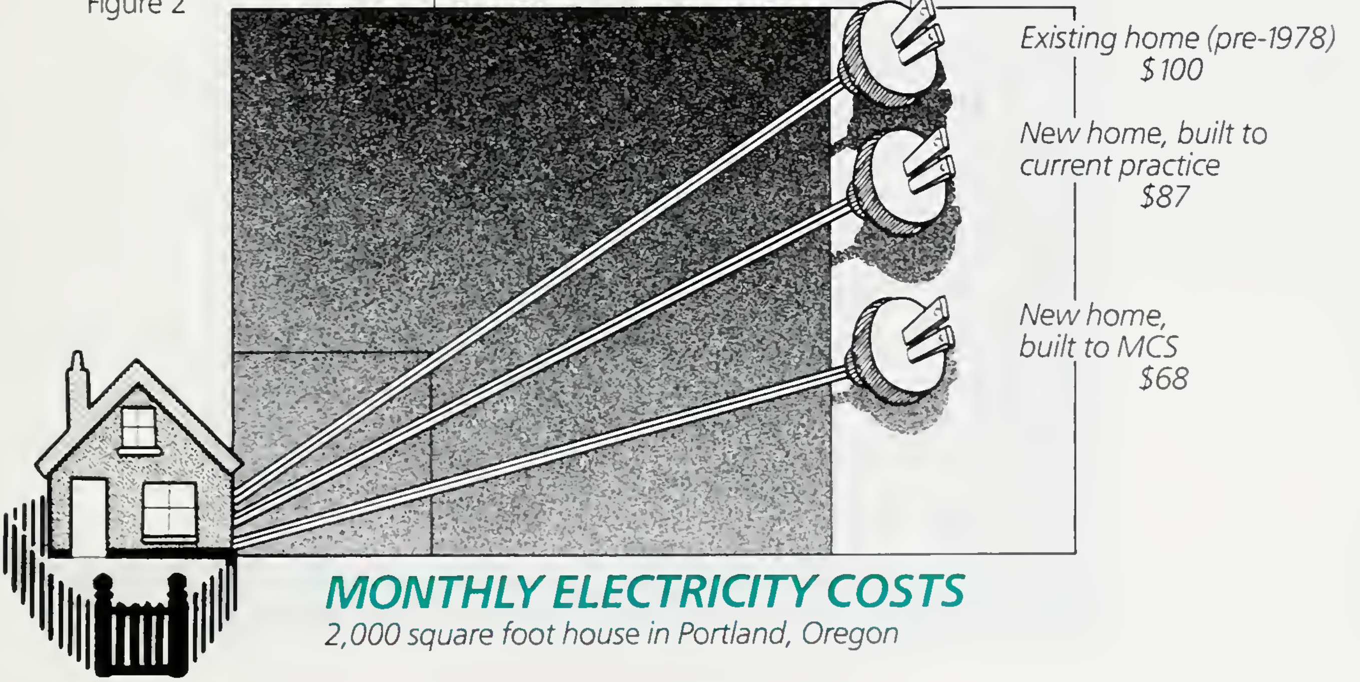
So far, the new forms and schedules have been received enthusiastically by lenders. The head of the valuation branch in HUD's Region 10 Portland office, Barry Wilson, deserves much of the credit for considering changes in the schedules. He says the new schedules "will give better estimates for utility costs than we've had available before." Wilson's boss, Diana Goodwin, director of the Office of Housing for HUD Region 10, is considering which format would work the best before implementing the new forms in Idaho, Oregon and Washington. Montana, which falls in HUD Region 8, is also considering implementing the change.

The Idaho Department of Water Resources has recently begun an ambitious Pilot Lender Project in the Idaho Falls area. The project's goal is to get the added value of energy conservation measures incorporated into the appraised value of houses built to the Council's model conservation standards and thus lower the debt-to-income ratio to finance these homes. According to Artie Dewey of the department, "a large part of the process will be to educate lenders who know little about the benefits of such a program."

Dewey notes that the project will show it is in the lender's best interest to help the buyer of an energy-efficient house qualify for loans more easily. Not only will the lenders market more loans, but they will do so to buyers with lower monthly utility bills. Such buyers are better loan risks. "We're trying to get lenders to accept this, not because they're good guys, but because they're smart guys," says Dewey.

In Montana, the Council is working with local HUD appraisers to introduce the new practice. Roger Linhart, manager of United Western Mortgage Corporation in Missoula, Montana, and current president of the local homebuilders association there, favors a better debt-to-income ratio for more energy-efficient homes. "We know this is a more accurate way of estimating utility costs for qualifying buyers," he says. "It just makes sense." ■

Figure 2



MONTHLY ELECTRICITY COSTS

2,000 square foot house in Portland, Oregon

Graphs by Stephen Sasser

Agreement Reached in Fisheries Feud

by John Volkman

In a landmark development in the Northwest's Indian treaty fishing disputes, the states of Oregon and Washington, the Nez Perce, Umatilla, Warm Springs and Yakima tribes, and the U.S. Departments of Interior and Commerce have reached a comprehensive agreement for harvesting and rebuilding Columbia River fish runs.

The agreement grows out of a 20-year history of court litigation on the Columbia River, involving the interpretation of four 1855 Indian treaties. In the treaties, the Yakima, Warm Springs, Umatilla and Nez Perce tribes gave up their claim to much of the land in the Northwest, reserving to themselves homelands (reservations), and the "right of taking fish at all the usual and accustomed places, in common with the citizens of the territory."

In the 1960s, the tribes' rights to fish were curtailed by Oregon and Washington because, by the time the fish runs returned to the tribes' upriver fishing sites, non-Indians in the ocean and lower river had already harvested most of the fish. Hence, "conservation clo-

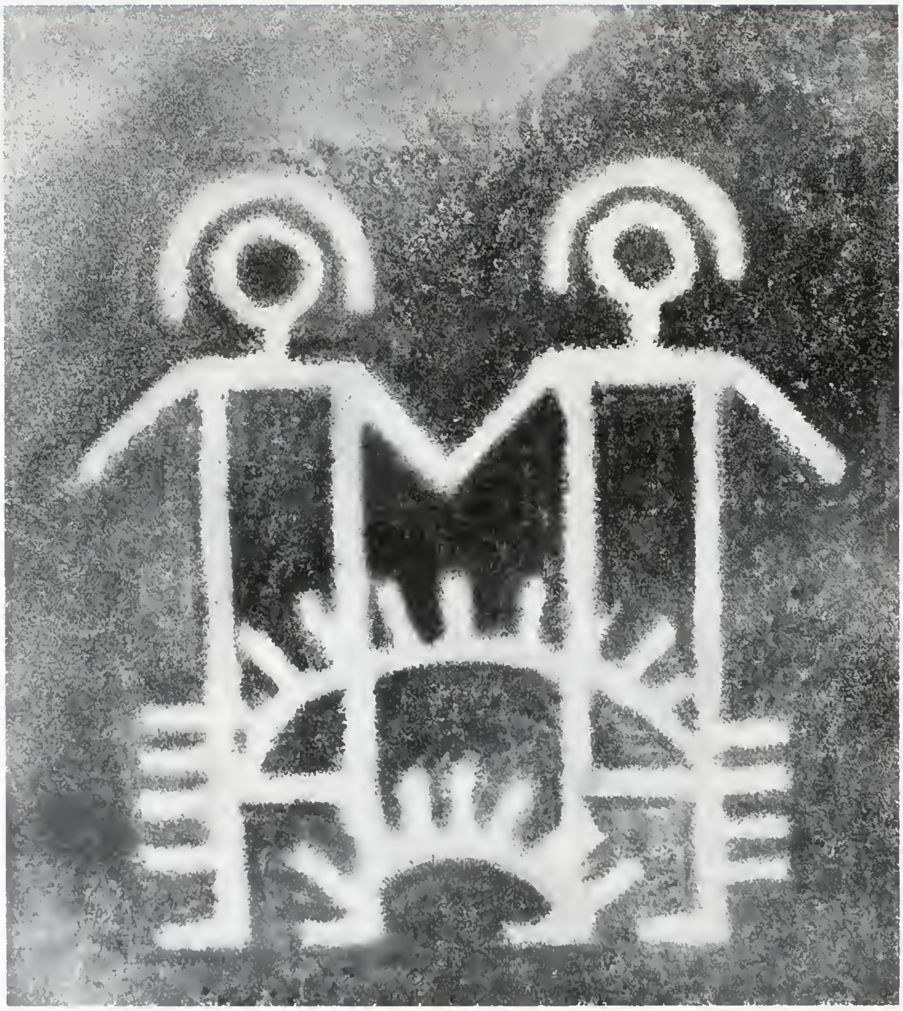


Illustration by "Upstream Productions"

sures" were ordered by the states to prevent the tribes from harvesting what little was left and threatening the survival of the runs.

In the late 1960s and early 70s, the federal courts began to require the states to control non-Indian harvest in the ocean and lower river to provide greater opportunities to the tribes to fish at their upriver sites. In 1974, Judge George Boldt in Washington held that the states must manage the runs to provide the tribes with opportunities to harvest roughly half of the runs. In 1977, the U.S. Supreme Court upheld this principle, subject only to the qualification that income from Indian harvest should not exceed the tribes' "moderate living needs." Although these rulings took place in Puget Sound, they were applied to the Columbia River tribes in the U.S. v. Oregon case as well.

The states and the tribes reached an agreement in 1977 on how to share the harvest in the Columbia River. However, the agreement had several weaknesses, and after a few years, the parties found themselves back in court. One of the key problems was the continuing decline of salmon and steelhead runs, partly from new dams in the Columbia River and partly from ocean harvest.

The agreement grows out of a 20-year history of court litigation on the Columbia River.

The agreement the parties have just reached is broader than the 1977 agreement, and it will operate in a much different environment. The U.S./Canada Pacific Salmon Treaty of 1985 restricted the harvest of Columbia River fish stocks in the ocean, and regulatory mechanisms are now in place to control the ocean harvest. The treaty also pledges the two nations to rebuild critical salmon and steelhead stocks, particularly naturally spawning chinook stocks, by 1998.

The second major difference between now and 1977 is that the Northwest Power Act and the Northwest Power Planning Council provide a program to fund efforts to rebuild upriver stocks. The parties are clearly relying on the Council's program to make rebuilding possible.

The third major difference is that the states and the tribes have been able to work cooperatively. This has paid significant dividends in the U.S./Canada Treaty negotiations, in the U.S. v. Oregon negotiations, and in Council activities.

The new agreement is designed to build on the U.S./Canada Pacific Salmon Treaty and the Council's Columbia River Basin Fish and Wildlife Program by: 1) controlling harvest on key stocks; and 2) providing a framework for increasing upriver fish production.

There are several issues that the agreement does not or cannot resolve. For example, throughout the agreement are commitments to supplement upriver runs with fish reared in hatcheries. Key unresolved questions are whether this supplementation will be effective, and whether supplementation will have acceptable impacts on wild fish stocks. No one at present can answer these questions to everyone's satisfaction.

Another problem, which ultimately made the State of Idaho unwilling to sign the agreement, involves wild steelhead. Idaho has two runs of wild steelhead, the smaller of which is called the "B" run. The B run consists of wild fish that return to their spawning ground at the same time the very strong run of upriver bright fall chinook returns. The upriver brights are a mainstay of the tribes' harvest. However, Idaho fears that fishing of the upriver brights could have serious adverse impacts on the B run. Idaho's Shoshone-Bannock Tribes have related concerns. The parties spent a lot of time on how much harvest could be permitted on the upriver brights without undermining the viability of the B run, but agreement could not be reached. These and other disagreements between the lower river states and tribes and Idaho interests may be discussed in federal court.

SHORTS

Five Super Good Cents utilities have received recognition for making a large portion of new homes in their service districts super energy-efficient this year. The Bonneville Power Administration, which sponsors the energy saving program, applauded the utilities' efforts at the Third Annual Super Good Cents Awards Banquet. The utilities include: Snohomish County Public Utility District, Lakeview Light and Power, Vera Water and Power and the City of Port Angeles Public Utility, all in Washington; and Unity Light and Power in Burley, Idaho.

New fish bypass facilities at John Day Dam on the Columbia River were awarded a national merit award for engineering during National Engineers Week this spring. The facilities, a system of submersible screens and channels to safely move ocean-bound juvenile salmon and steelhead away from the turbines and past the dam, were constructed as part of the Columbia River Basin Fish and Wildlife Program. The Portland District of the U.S. Army Corps of Engineers received the award from a panel of non-governmental experts. (Source: *The Dalles Chronicle,* The Dalles, Oregon.)

Oregon volunteers released 12 million salmon and steelhead fry last year as part of the Salmon and Trout Enhancement Program (STEP). STEP has been using volunteers to improve salmon habitat, set out hatch boxes for incubating young salmon and steelhead, and survey streams for their acceptability for producing more fish. The program was initiated in 1981 and is funded through the state Sport Fish Restoration Program. (Source: *The Oregonian,* Portland, Oregon.)

The British Columbia Hydro and Power Authority (BC Hydro) has joined the ranks of utilities choosing conservation over new generating resources. The Canadian utility, which had gone on record in recent years arguing against conservation as a resource, has now begun offering programs aimed at saving roughly 350 average megawatts. (Source: *Northwest Conservation Act Report,* 3429 Fremont Place North, Suite 308, Seattle, Washington 98103.)

Sport fishing in Washington for Pacific salmon and sturgeon brings a considerable sum of money into that state's economy, concludes a recent report called for by the state's legislature. The report indicates that sport fishing brings in far more than commercial fishing. However, the conclusions were tempered by numerous caveats. While the report found that commercial fishing in Washington only attracted a net profit of $1.4 million (compared with sport-fishing values closer to $44 million), it also pointed out that only non-Indian fishers within Washington's regulated waters were tallied. This number probably only represents a fraction of the actual sales, since a large portion of the state's commercial catch was determined by court order to go to the tribal fishery, and an even larger portion is caught beyond the Washington regulatory boundaries but still by Washington fishers. In addition, the study period runs from 1982 through 1985, coinciding with the devastating effects of El Nino on the fisheries. (Copies of the report, "Economic Impacts and Net Economic Values Associated with Non-Indian Salmon and Sturgeon Fisheries," are available from the Washington Department of Community Development, Ninth and Columbia Building, Mail Stop: GH-51, Olympia, Washington 98504-4151, 206-753-2200.)

The promise of inexpensive electricity from solar energy may soon be realized thanks to advances in the efficiency of photovoltaic cells. Researchers funded by the Electric Power Research Institute and based at Stanford University have developed new photovoltaic cells that have an efficiency of 28 percent, as compared to current cells that only achieve 15-percent efficiencies. One drawback of the cells is that they only make electricity from direct sunlight, not filtered or hazy light. But utility representatives in the sunny Southwest are paying close attention to the research. The goal is to develop a generating plant that could produce electricity from the sun for between 6 and 7 cents per kilowatt-hour, comparable to oil generation at $25 a barrel. (Source: *New York Times,* Wednesday, March 30, 1988.)

CALENDAR

June 5-10 — Second "International Congress on Energy" in Tiberias, Israel. Sponsored by the Israel Ministry of Energy and Infrastructure. For more information: Dr. P. Glueckstern, IMEI, Box 29313, Tel Aviv, Israel 65121.

June 8-9 — Northwest Power Planning Council meeting at the Riverhouse in Bend, Oregon.

June 27-29 — American Public Power Association's 1988 National Conference in Seattle, Washington. For more information: American Public Power Association, 2301 M Street, N.W., Washington, D.C. 20037, 202-775-8300.

June 27-July 1 — "International Symposium and Educational Workshop on Fish-marking Techniques" at the University of Washington in Seattle. Sponsored by the American Fisheries Society and the U.S. Fish and Wildlife Service. For more information: Conference Management, GH-22, University of Washington Extension, Seattle, Washington 98195, 206-543-2300, extension 348.

June 29-30 — Northwest Power Planning Council's first annual Salmon and Steelhead Round Table at the Rippling River Resort near Portland, Oregon.

July 13-14 — Northwest Power Planning Council meeting at the Edgewater Lodge in Sandpoint, Idaho.

August 10-11 — Northwest Power Planning Council meeting at Cavanaugh's Motor Inn in Kalispell, Montana.

November 8-9 — Energy EXPO '88, a trade show and conference for gas and electric energy conservation for commercial and industrial uses, in Milwaukee, Wisconsin. Sponsored by ANCO of Wisconsin. For more information: Kevin S. Anderson, Energy EXPO '88, ANCO, Public Service Building, 231 W. Michigan, Room 226, Milwaukee, Wisconsin 53201, 414-221-4801.

November 29-December 3 — "Housing for the 90s" at the Sheraton Tacoma Hotel, Tacoma, Washington. Sponsored by the Energy Business Association. For more information: Patricia Anderson, Energy Business Association, 420 Maritime Building, 911 Western Avenue, Seattle, Washington 98104, 206-622-7171.

A more detailed calendar of Council committee meetings and consultations is carried each month in *Update!* See order form on back cover.

Compiled by Ruth L. Curtis

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The Northwest Power Planning Council is required to develop a program to restore the Columbia fisheries and a regional electric energy plan, to be carried out by the Bonneville Power Administration, emphasizing cost-effective conservation and renewable resources

Executive Editor: Carlotta Collette
Art Director. Stephen Sasser
Special Departments Editor
Ruth Curtis
Production: Marty Todd

COUNCIL PUBLICATIONS ORDER FORM

Please send me a copy of the following publications of the Northwest Power Planning Council. (Note: not all publications are available immediately, but they will be sent to you as soon as possible.)

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☐ 1987 Columbia River Basin Fish and Wildlife Program
☐ 1986 Northwest Power Plan
☐ 1987 Northwest Power Planning Council Annual Report
☐ 1988 Draft Annual Report
☐ (9-88) Proposed Amendment Regarding Protected Areas
☐ (2-88) Staff Issue Paper: Plans for a Technical Update to the 1986 Power Plan
☐ (6-88) Economic, Demographic and Fuel Price Assumptions (draft)
☐ (8-88) Demand for Electricity in the Pacific Northwest (draft forecast)
☐ (7-88) Model Conservation Standards for New Commercial Buildings
☐ Western Electricity Study briefing papers:
  - (3-87) Western System Overview
  - (4-87) Electricity Use in the Western U.S. and Canada
  - (14-87) Interregional Transactions
  - (7-87) Existing Generating Resources (draft)
  - (13-87) Future Resources (draft)
  - (3-88) Load/Resource Balances (draft)

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☐ *Northwest Energy News* (this bimonthly magazine)
☐ *Update!* (monthly public involvement newsletter that contains the Council meeting agenda and a more detailed publications list)

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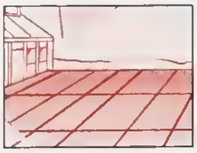

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Editor's Notes

It has been a busy summer at the Council, and there appears to be no letup in sight. In June, Oregon Governor Neil Goldschmidt announced his choice of former State Senator Ted E. Hallock to replace Robert Duncan on the Council. Duncan announced his resignation in March. As we went to press, Hallock's appointment still required approval by the Oregon legislature.

The Council is currently updating the technical basis for the Northwest Power Plan; considering amending both the power plan and the Columbia River Basin Fish and Wildlife Program to incorporate areas designated as protected from future hydropower development because they are critical to fish and wildlife; and coordinating planning in 31 subbasins of the Columbia Basin to determine their potential contributions to the goal of doubling salmon and steelhead runs in the basin. These activities and more will be covered in the Council's Eighth Annual Report, to be sent to our Energy News mailing list in October. Drafts of the report are available for comment through August 1, 1988.

Cover illustration is by Lyn Nance

Surveying the Range of Uncertainty

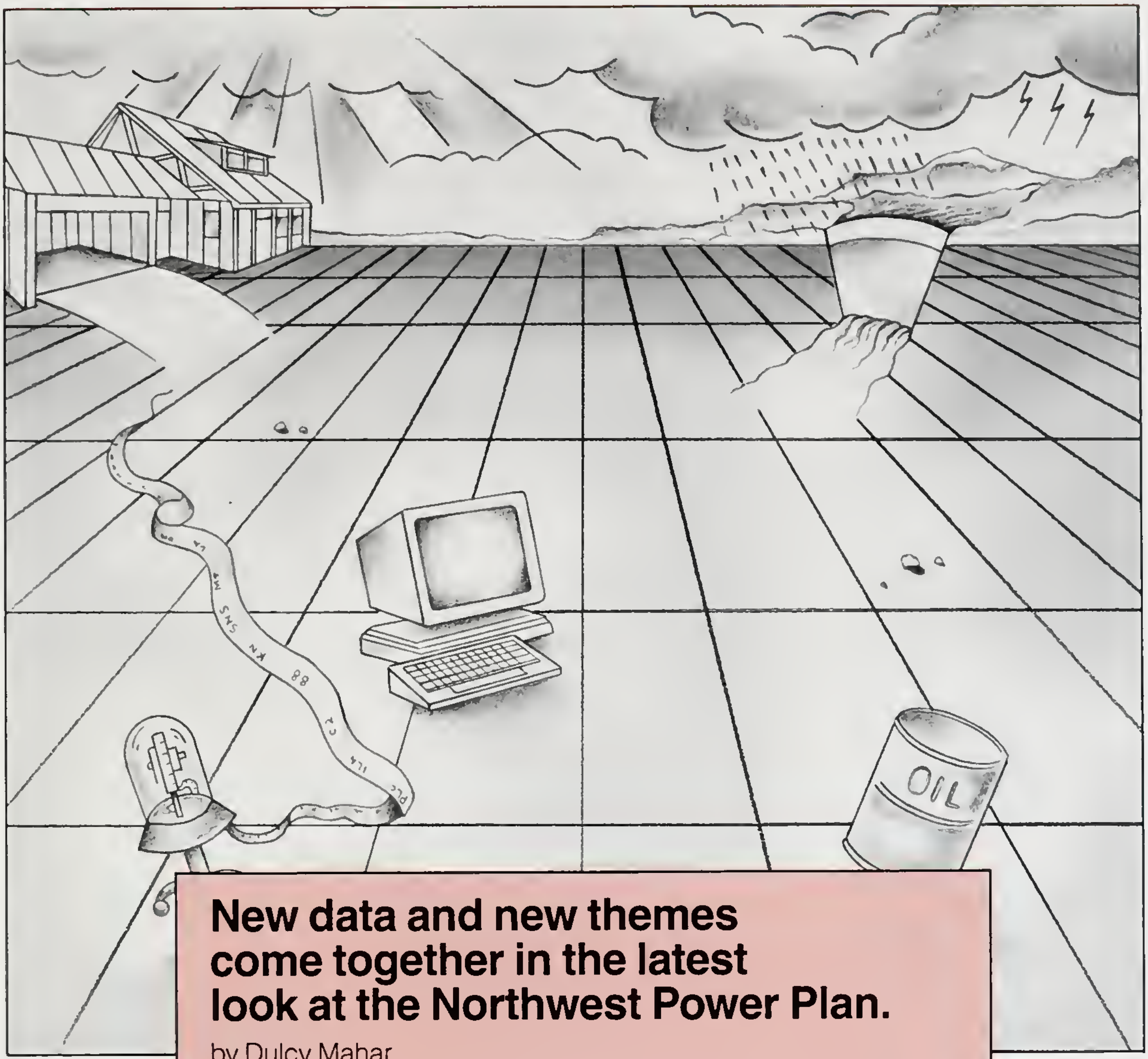


Illustration by Lynn Carson

New data and new themes come together in the latest look at the Northwest Power Plan.

by Dulcy Mahar

Change in the Northwest's electricity picture cannot always be measured in years; sometimes it's a matter of months or even weeks. A myriad of influences come into play. For example, technologies grow; studies are completed, and more data becomes available; price fluctuations affect the competitive ranking of various energy resources; economic growth exerts new demand on electricity; and resource availabilities shift subtly and, sometimes, not so subtly.

For these reasons, the Northwest Power Planning Council is updating the technical data, facts and assumptions that underlie its 1986 Northwest Power Plan. While the technical update is not an overall review of the plan , it will guide the Council in determining if individual amendments or an overall review are needed.

In particular, this re-examination of the numbers should provide a better basis for considering possible changes to the Action Plan, according to Jim Litchfield, the Council's director of power planning. The Action Plan is that section of the power plan which spells out specific steps to be taken in the near term to achieve the overall goals of the 20-year power plan.

Preliminary Forecasts of Future Energy Use

The updating process began in March, when the Council released preliminary assumptions about the Northwest's economy and fuel prices, both of which could affect how much electricity the region will need over the next 20 years. This information then became part of a preliminary forecast of electricity demand for the planning period. The forecast was something of an historic event in the region, because it was the first time the Council and the Bonneville Power Administration had issued a joint forecast, timed to coincide with both Bonneville's budget cycle and the Council's technical update.

While both agencies reserve the right to make independent determinations on the final forecasts, the Council and Bonneville are conducting the public review process jointly. This decision was made partly as a natural outgrowth of the fact that the two agencies already share computer modeling and data, and partly in response to earlier public comment that it was difficult and redundant to track two processes.

Based on public comment made on the preliminary forecast, a joint-revised draft forecast was issued for further comment in June. The revised paper noted that the region's 1986 sales of firm power (electricity guaranteed and contracted for) had been 15,300 average megawatts.

Because of the uncertainty over what will happen over the next 20 years (and the economic repercussions of a wrong guess), the Council instituted a practice of framing the forecast in terms of a range of possibilities encompassing low to high regional growth.

In the low forecast, electricity use was estimated to grow to only 15,800 average megawatts by the year 2010; while growth in the high forecast was predicted at 28,600 average megawatts. The difference between the two extremes, 12,800 average megawatts, indicates the degree of uncertainty inherent in the region's power system.

Regional growth in electrical use is most likely to fall between the medium-high and medium-low forecasts, a spread of 4,300 average megawatts. This compares to the 1986 plan where there were 10,980 average megawatts between the high and low forecasts and 2,737 average megawatts between the medium-high and medium-low forecasts.

Conservation and Generating Resources

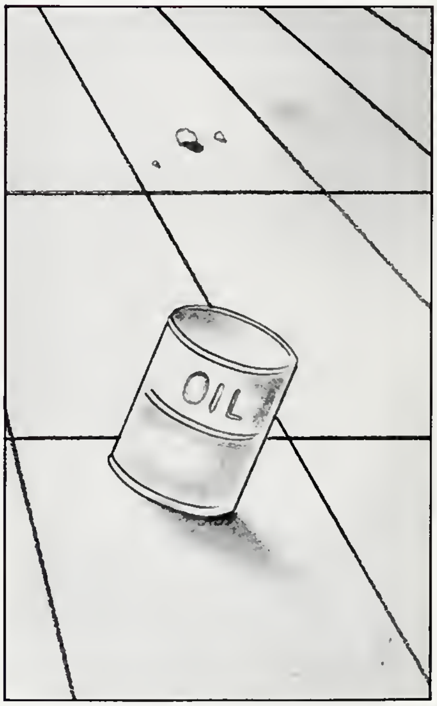
Where the electrical load growth forecast functions as a map of the Northwest's electrical future, the Council's resource portfolio is the means of transportation to that future. The resource portfolio contains the most cost-effective mix of available electrical energy resources the region will need to acquire to fulfill the need outlined in the forecast. Resources in the portfolio are scheduled with the most economical and readily available ones acquired first. More efficient use of existing energy is considered most cost-effective of all resources. Thus, conservation is the Council's first-choice resource.

In June, the Council also released for public comment issue papers containing analyses of the region's conservation and generating resources. Proposed changes in the resource portfolio were scheduled for release in July, with hearings set for August on the power plan update process. The Council anticipates adopting final revisions in September.

Changes occurring since the 1986 Power Plan was adopted that may affect the selection and scheduling of resources include:

Conservation resources:

- substantial new data on the amount of conservation available in the commercial sector;
- new information on residential weatherization costs and the amount of weatherization that has already occurred;
- impacts of new nationwide appliance efficiency standards; and
- new state building codes.



Generating resources:

- completion of studies on increasing the efficiency of the electrical power transmission and distribution system and on the potential energy savings from improved regulation of the distribution system voltage;
- current negotiations between the United States and Canada to improve coordination of the Columbia River system;
- substantially improved information from the Council's protected areas studies about the potential for new hydropower development in the region:
- declines in fossil fuel prices such as oil and gas;
- improved estimates of cogeneration;
- improved technologies, including combustion turbines and coal gasification; and
- possible strategies for extending the useful life of the generating plant adjacent to the Hanford N-reactor.

Other Potential Changes

Some non-substantive restructuring of the plan's narrative is also expected. Such changes are intended to dispel reported misconceptions, according to Jim Litchfield. "Probably the key misconception we've heard is that the plan is for the whole region, not for any particular entity, and therefore it doesn't really apply to anyone in particular," Litchfield said.

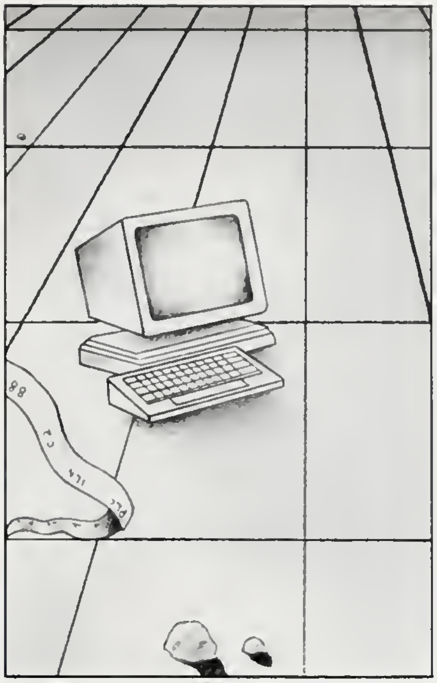
"This isn't correct. The Northwest Power Act requires the Council to develop a plan to meet the Bonneville Administrator's obligations as well as a least-cost plan for the region. Some regionwide mandates are clearly in the Act—such as ensuring that model conservation standards achieve all regionally cost-effective electrical energy savings—and this has led to misunderstanding," Litchfield explained.

The 1986 plan begins with an aggregate view of the region and its utilities, and works toward individual components, such as Bonneville's needs in the resource portfolio and responsibilities in the Action Plan. Litchfield suggests the new version may well reverse that direction, beginning with an examination of the components and working toward a regional outlook.

He expects the revision to provide additional analysis and focus on Bonneville's possible as well as known loads. He points out that each of Bonneville's customer groups represents some uncertainty. Even those utilities that have no generating resources of their own and rely entirely on Bonneville require widely varying amounts of electricity to meet their loads. Public utilities that generate some of their own power also experience load swings and, in addition, have been discussing reducing their reliance on Bonneville—a prospect that compounds Bonneville's uncertainty.

The direct service industries, primarily aluminum companies that buy power directly from Bonneville, have always been unpredictable, with load swings depending on both world aluminum prices and the price of electricity. Even the investor-owned utilities, which do not currently place firm loads on Bonneville, are a question mark because they can place loads given seven years' notice.

"Every customer group represents a piece of uncertainty, and we have to look at how best to manage that uncertainty at the lowest possible cost," Litchfield said.



Another change reflected in the technical update will be the estimates of how much conservation remains to be developed in the region. The Council treats conservation as a resource—equivalent to a generating resource—as required by the Act. Consequently, the Council subjects conservation to the same analysis for cost-effectiveness as for all other resources.

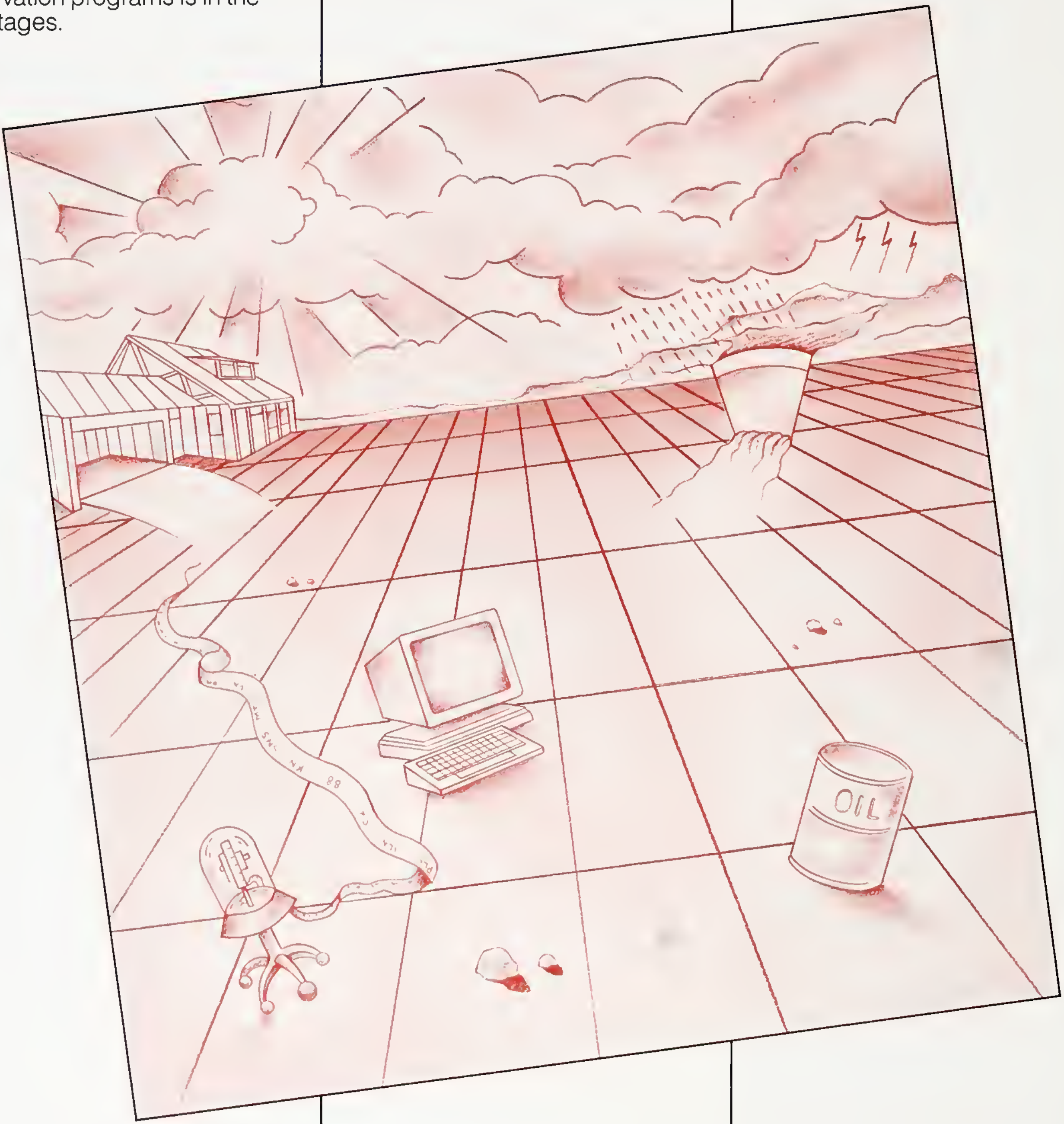
"We treat future conservation as a supply-side resource much like any generating resource, to keep it on the same playing field in front of decision-makers," Litchfield explained. "However, once conservation has been acquired, it manifests itself as a load reduction in the forecast." For example, because of the new national appliance efficiency standards, an assumption was made at the time the new draft forecast was developed that there would be less energy needed for appliances in the future.

If someone looks at the figures in the resource portfolio and sees that the Council is identifying less available conservation, it could be misinterpreted to mean that the Council is placing less emphasis on conservation. But what people will really be seeing is a reduction in the amount of conservation available over the 20-year planning period, because some of it has been or will be "acquired" through recently adopted energy codes and standards. Litchfield believes the region can expect to see a continuing decrease in available conservation, except in some sectors where development of conservation programs is in the early stages.

Five advisory committees—Economic Forecasting, Demand Forecasting, Generating Resources, Conservation Supply Curves and State Agencies—have been working with Council staff to prepare the technical update. Committee members include technical experts in these specific areas, as well as members of the general public representing a wide variety of viewpoints and interests.

This update should provide the Council with the data to fine tune its Northwest Power Plan and, if the new information suggests such a direction, to move into subsequent revisions of the Action Plan. ■

Copies of all issue papers related to the power plan update are available to the public and listed on the back of this publication.



DULCY MAHAR INTERVIEW WITH

Bill Bakke

Oregon Trout's outspoken executive director reflects on the interests of anglers.

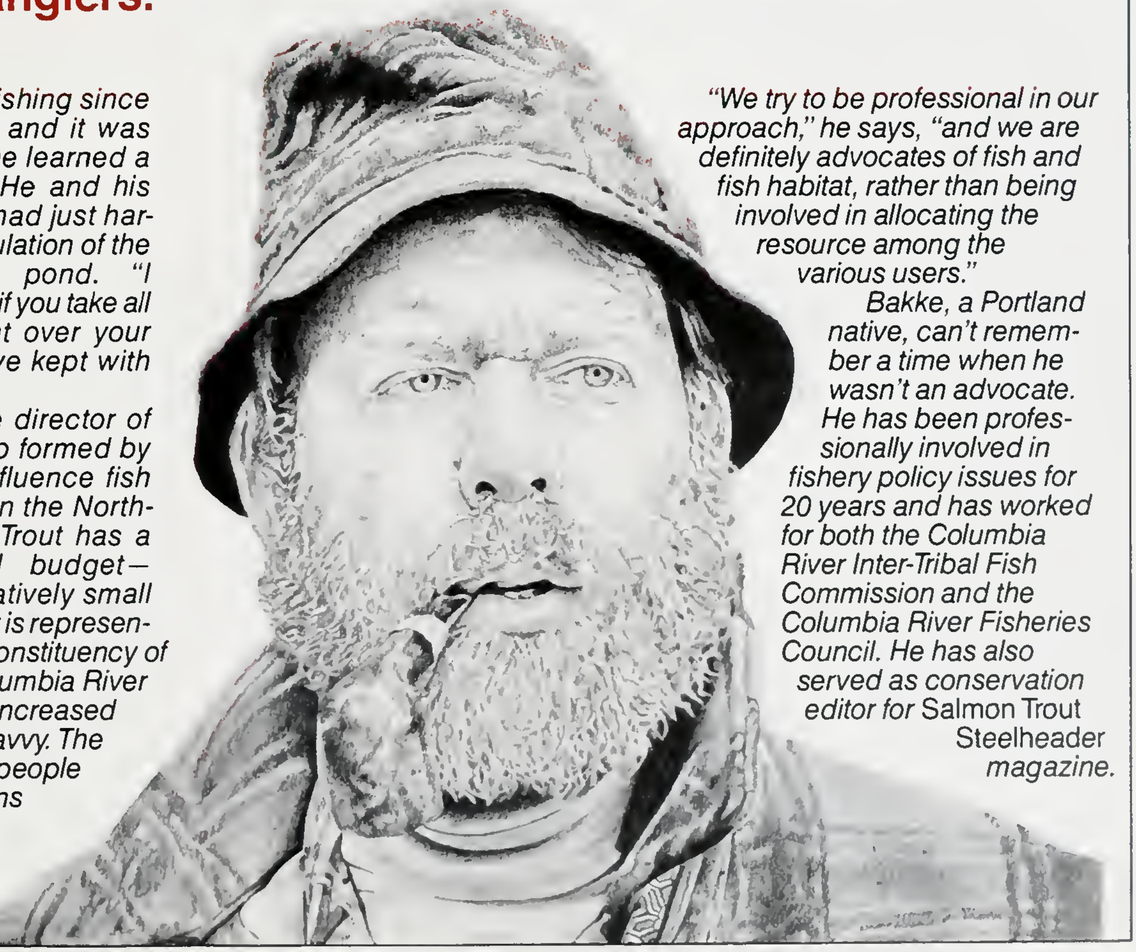


Illustration by Lynn Carson

Bill Bakke has been fishing since he was 4 years old, and it was about that time that he learned a great lesson in life. He and his Doberman pinscher had just harvested the entire population of the neighbor's goldfish pond. "I learned very early that if you take all the fish, they cement over your pond. It's a lesson I've kept with me."

Bakke is executive director of Oregon Trout, a group formed by anglers in 1983 to influence fish management policy in the Northwest. While Oregon Trout has a "shoestring" annual budget—$100,000—and a relatively small membership—1,200, it is representative of the growing constituency of sport fishers in the Columbia River Basin that is showing increased political muscle and savvy. The group was formed by people from other organizations who wanted a vehicle that could take on the "political world," according to Bakke.

"We try to be professional in our approach," he says, "and we are definitely advocates of fish and fish habitat, rather than being involved in allocating the resource among the various users."

Bakke, a Portland native, can't remember a time when he wasn't an advocate. He has been professionally involved in fishery policy issues for 20 years and has worked for both the Columbia River Inter-Tribal Fish Commission and the Columbia River Fisheries Council. He has also served as conservation editor for Salmon Trout Steelheader *magazine.*

"I guess when I first started out, I was primarily a fisherman," he says. "And there's kind of an evolution you go through. You start noticing oceans and rivers and fish, and you begin to ask why about different things." For Bakke, that led to reading scientific journals. "They taught me a lot about the resource. I became more acquainted with fish and how they adapt to their environment." He remembers a time when "you'd catch a fish and take it to the local store to get it weighed and have your picture taken. The person at the hardware store could tell you where the fish came from. The fish from each river looked different. We've lost a lot of those distinctions now with the expansion of the hatchery program."

As for fishing secrets, Bakke is enigmatic: "The thing I've always tried to do is let the river tell me what its secrets are, and I am open to what the river wants to say. It has a lot to say, but you have to be prepared to listen."

Q. Let's start with the big picture. What progress, if any, have you seen under the Council's Columbia River Basin Fish and Wildlife Program or as a result of the Northwest Power Act?

The progress I see has been primarily the funding that has been available for habitat improvement. I see very definite improvements in fish habitat to make it more complex and thereby more productive to both adults and juvenile fish. I think that is a good investment. I also believe that the fishery agencies and tribes have gained some control over the spring flows [on the mainstem of the Columbia] to help the outmigration of juvenile salmon. This has been a definite improvement over what we were faced with before.

Another important thing happening in the basin because of the Council is that you're getting all the various parties together and trying to resolve problems. This is really important because it is allowing public interest groups on the outside to be involved in those discussions. They now have some status, some input and some recognition for their positions within the decision-making process. That was largely inaccessible to us before, because there is such fractured management in the Columbia River Basin among the various state resource agencies and the power interests. It was so fractured that it was very hard to participate, and you could only do it through the state.

The Council has brought all that together, and it has encouraged us all to try to resolve common problems. That has probably been the largest benefit of the Council in terms of trying to improve the management of the Columbia River system for fish and wildlife. There are basically two approaches: on-the-ground improvements and the cultural improvements that the Council has caused by bringing the parties together.

Q. What do you see as the big issues ahead of us?

I see as the major problem the fact that the goal for salmon and steelhead restoration in the basin is primarily a numerical goal [doubling Columbia Basin runs] without a clearly stated biological objective. I'm concerned that the restoration of the fish resources will not take place. What we'll get is additional production for more harvest, rather than protecting and maintaining a long-term persistence of the natural resource.

Q. How would you characterize a biological goal?

A biological goal would be not sacrificing any more of the genetic resources in the basin. That would include the hatchery as well as natural fish populations. We have already recognized that we've lost some of those stocks and are continuing to lose more. The Snake River coho was designated as extinct last year, and it looks like the Salmon River sockeye will be the next to go extinct. There has been indication that we've lost the native spring chinook in Hood River.

We don't know the extent of the loss because we have very poor inventory information, and this region has consistently failed to make the investments needed to understand how the natural system operates. Instead, we have invested in hatcheries. With this approach, we are passing on to future generations a bill to be paid rather than a self-sustaining, renewable resource.

Without including chinook and chum salmon, I've calculated, based on scientific records, that we've lost 101 stocks, and they are at the extremes of the basin. They are upper Columbia River stocks in Canada, and they are Snake River stocks. Within the basin, we're losing the diversity of stocks that are adapted to extreme environments. A large chunk of the genetic resource has been eliminated through the development of the basin. So a biological goal would be to make sure we don't lose any more

resources, because the extinction record for the Columbia River basin is large. We have a small part left to work with, and we shouldn't be losing any more of it.

Q. I realize there is not a simple answer, but what would you see as an appropriate balance of hatchery and wild fish?

There is no balance. I don't think a balance is achievable. Everybody speaks about balance being achievable, for instance talking about a better balance between natural and wild production. Fishery management is taking on more and more of an agricultural approach to fisheries, where you are essentially farming fish for commodity production. Maintenance of wild stocks under that kind of a program can't be done. The reason it can't be done is that we are managing fish populations for short-term goals rather than long-term productivity. The question for the Council and cooperating agencies is how do you obtain long-term goals in a short-term world?

Q. Why is genetic diversity important to the basin?

There is a production advantage in our fish genetic resources. Fish are adapted to the environments they are reproducing and rearing in, and those fish have a productive edge over hatchery fish. That production advantage isn't fully recognized by the public or the agencies. In the Columbia Basin, I only know of two studies that give us a handle on how productive natural fish are within the ecosystem. That's a very limited amount of scientific attention, and we have consistently avoided funding that kind of research.

The Kalama River Study showed that a highly domesticated stock of hatchery steelhead placed into the natural environment were very unproductive in terms of producing the next adult generation, and that wild fish were 8.5 times more successful at producing the next adult generation

than were hatchery fish in the natural environment. So there is an advantage that natural stocks have in the environment, and we shouldn't squander that capacity. However, we are doing just that.

Right now I don't think we're poised in such a way that we take advantage of that natural productivity. We're saying, in a sense, that we can replace it with hatchery fish, and that hatchery fish and natural fish are equal. Scientific information is showing us that that isn't true, but we're not paying attention to it.

Q. Would you advocate stopping all hatchery production?

No. The way hatcheries are operated is the problem. Right now there is no gene conservation program within the hatchery system. There are a few instances where we are beginning to see hatcheries operated as part of the ecosystem, but they are exceptions.

The hatcheries are put there as large pumps to push more fish into the system and overcome some of the bottlenecks. If you paid more attention to having the hatcheries operate within an ecosystem and to having a gene conservation program within the hatchery system, then you would have a better program.

There are some hatcheries that are operating wisely within their ecosystems, like the Warm Springs Hatchery. Warm Springs has been widely recognized for the way it was set up. They are working with a wild spring chinook population, and they are supplementing it with hatchery fish. They are doing it in such a way that they are maintaining the wild stock, and it was the objective from the start to maintain the wild run. They had a biological objective; they didn't want to decrease the ability of wild fish to survive within the river. The hatchery program is attempting to maintain the life history characteristics of the wild run.

It is just amazing how very well thought out and well executed this hatchery program is, but it didn't have the blessing of the funding agency.

I'm concerned that the restoration of the fish resources will not take place. What we'll get is additional production for more harvest, rather than protecting and maintaining a long-term persistence of the natural resource.

Q. Could you explain the difference between the terms "wild" and "natural" fish?

This is an interesting distinction. Let me give you a little background on it. Oregon's coho plan started out with "wild" coho, and now it has been redefined as the Oregon coastal "natural." I am working on the chinook plan on the coast for Oregon, and there has been a large debate among the technical staff between whether the term should be "wild" or "natural." And then you see the terms come up in the Council's program where "wild" was redefined as "wild and natural."

What's happened is that, through redefinition, the agencies are trying to minimize or remove the emphasis on conservation. Wild production, as I see it, is really the primary constraint upon harvest management. In order to get production of wild fish in streams, you have to have a spawning escapement [fish allowed to return upriver to spawn rather than be caught]. What we're doing instead is putting hatchery fish into the natural environment for rearing, rather than trying to get a spawning escapement of wild fish that are native to that system.

By redefining wild out of the equation, we're ending up with less constraint on harvest management, less of a conservation burden for the states and tribes. And ultimately, the agencies will be able to argue effectively that wild fish do not exist due to their supplementation programs. They will then be able to escape their responsibilities under the Endangered Species Act.

Q. So fish that are born in a hatchery but are outplanted to streams are called "natural" fish?

That's right, and they have been selected for survival in the hatchery rather than in the natural environment. Without a hatchery program that is concerned with gene conservation, what you're doing is putting maladapted fish into the natural environment. They will come back and breed with wild fish, and eventually it is going to eliminate the wild population.

I remember Jack Donaldson [executive secretary of the Columbia Basin Fish and Wildlife Authority] saying there are probably no pure wild fish in the basin. That's immaterial. The point is that you want to maintain throughout the basin fish that are genetically adapted to various natural environments.

Instead, we just put hatchery fish in those environments and expect them to produce adults for harvest. If the river is short on spawners, the agencies will just put more hatchery fish into that environment. Consequently, overfishing and interbreeding will destroy the wild runs.

If we can increase the runs by 2.5 million, then we have reached a goal, but have we reached a goal that is going to be lasting? The goal is numerical, but if it has no biological foundation; it may not last very long. We are already having trouble with the hatcheries in terms of genetic changes in the fish, lower survival and disease problems.

Q. What ways would you change the Council's direction if you could change the program?

We have asked the Council to adopt a gene conservation program and hire a geneticist to help direct subbasin planning [to determine fish production levels and methods in individual tributaries] and to help develop the hatcheries that the Council has approved. We have asked that they essentially have a genetic emphasis as one of the goals of the Council's program. The more diversified that program is, I think, the better it is going to be. A numerical goal is fine, but we also need genetic goals. We want there to be a goal of maintaining the existing breeding units within the basin. If we have a diversified goal like that, we're going to be closer to hitting the target in terms of long-term persistence of the resource.

Q. In the 1987 program amendments, the Council set a priority on preserving gene pools. You don't think that emphasis is strong enough?

No, it is not strong enough. Nobody understands it. In fisheries, our understanding of genetics is about 100 years behind agricultural genetics. We've invested very little money in understanding genetics and understanding how natural systems work and how those fish live within those natural systems. We know a lot more about how to raise fish in hatcheries than we know about how fish rear and raise themselves in natural environments.

Right now the agencies and tribes don't have any control over the habitat that produces the fish, therefore, the option is to build hatcheries.

This started back in 1878 when the supply of fish was going down because of overharvesting. The canners built a hatchery in the Clackamas River, and the state took it over. The conventional wisdom of the time was, if they could release more fish, they would be able to harvest more fish. That was the beginning of the hatchery system, and the mentality hasn't really changed. The application of the technology is essentially an industrial approach to the production of fish. We can overcome the constraints, the lack of authority over habitat, and still have our fish, even though our habitat is going to hell.

We have now gone full circle. We began by releasing fry into streams, but found there could be better survival if we released them at a larger size. We have now returned to fry released and outplanting smolts without having learned much about how natural systems work.

I think the Council is making some important headway with its genetic/technical work group. They are trying to take what we know about genetics and make it applicable to fisheries management. I think that is going a lot further than we have ever gone before.

Q. In addition to genetic conservation, how would you change the hatchery system?

The hatcheries should be based more upon smaller breeding units, smaller hatcheries doing a minimum amount of genetic selection, rather than these huge hatcheries like Lyons Ferry and what we're looking at in the Yakima Basin and in northeastern Oregon.

But we're not going in the direction of smaller hatcheries. We're going toward bigger is better, toward cost-efficiency, rather than managing the hatchery within the ecosystem. For instance, the genetic goal would be to have as large an effective population size as possible to prevent genetic drift and prevent inbreeding. But the major goal of the hatchery system is to use as few adults as possible in the egg-taking operation. These goals are diametrically opposed.

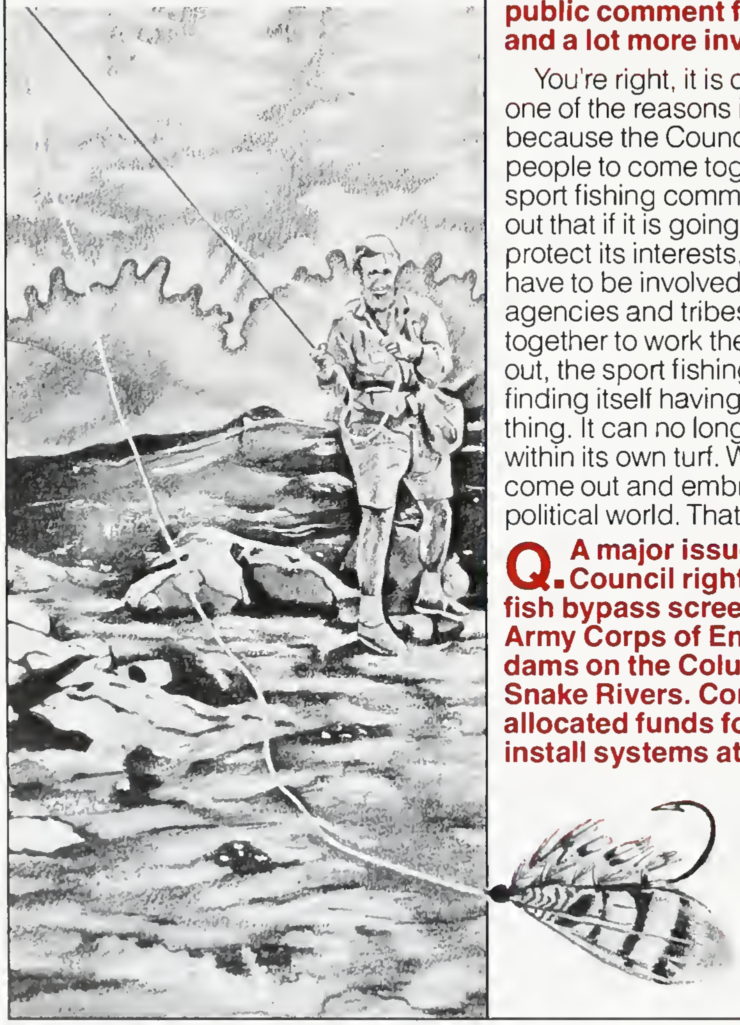
We know a lot more about how to raise fish in hatcheries than we know about how fish raise themselves in natural environments.

Q. How important are the commercial and sport fishing industries to the Northwest? I don't mean just in terms of dollars, but in other values as well.

The sport fishing industry, Indian fishery, lower river gillnet fishery and the troll fishery are cultural institutions. They are extremely important to our sense of well being. They are extremely important to why people live in the Northwest.

The management of the fisheries should complement that cultural diversity, whether gillnetters or sport fishermen or the others. The Northwest would be poorer without its fisheries. But we must learn that good fisheries are a by-product of good fish management.

The Northwest fishery is also unique, when you look at it on a worldwide basis, in terms of public access to fish. But we also have to recognize that the salmon resource now in the Northwest is a very restricted ecological resource. I would hope the lifestyles that have developed around the fishery could be maintained, because they are essentially unique to this coast. We've lost a lot of those lifestyles on the East Coast where we once had a similar fishery. But because we live with these fisheries, I guess we don't recognize their uniqueness, even though, to those involved in those fisheries, they are irreplaceable ways of living that must be and are fiercely embraced.



Q. What are sport fishing groups doing to be involved in public policy?

More and more they are getting involved. Oregon Trout was formed to be involved in public policy and essentially to be an advocate for fish and fish habitat. We recognize that there is a close link between habitat protection and fish production, and that public policy decisions and the funding of those policies are probably the primary arenas in which the sport fishing community can be effective in terms of providing long-term improvements in the fishery resource. In the long term, I think you can make greater gains by being involved in legislative, budgetary and policy decision matters than in the more appealing rock-rolling projects.

Q. Sport fishing groups appear to be becoming much more active now. All of a sudden it seems as if we're getting more calls from anglers' groups to send speakers. I've seen a lot more public comment from them and a lot more involvement.

You're right, it is changing. But one of the reasons it's changing is because the Council has caused people to come together. The sport fishing community is finding out that if it is going to be able to protect its interests, it is going to have to be involved. Now that the agencies and tribes are pulling together to work their differences out, the sport fishing community is finding itself having to do the same thing. It can no longer reside within its own turf. We're having to come out and embrace the larger political world. That's really healthy.

Q. A major issue for the Council right now is the fish bypass screens at the U.S. Army Corps of Engineers' dams on the Columbia and Snake Rivers. Congress allocated funds for 1988 to install systems at each dam so young salmon and steelhead heading downstream are spared having to pass through the turbines. The Corps has stalled on that work. Is this an issue for your organization?

That issue is a high priority because the mainstem is the funnel through which all the fish go, hatchery and wild. We have no hope whatsoever of restoring runs into the upper basin and specifically naturally produced runs, as long as that funnel is not operating effectively to protect those fish in their downstream migration. So it is vital. It angers me tremendously that the Corps chooses not to spend the money that has been appropriated for bypass facilities. We have been working through the American Fisheries Society, in Washington, D.C., to try to correct this problem.

Q. What about recent developments in reducing feuds between sport and tribal fisheries?

I think it is really positive. As long as fishermen are fighting one another they are not dealing with the big problems that the resource is faced with. I wish the conflicts would go away, but they don't.

While the sport fishermen are fighting the tribes or lower river gillnetters, they are not focused on the Forest Service and habitat damage. They are not focused on the BLM [Bureau of Land Management] or BPA [Bonneville Power Administration], and they are not focused on the Corps. In terms of limiting fish production—killing fish—those are the big harvesters in the basin, not other competing users.

Just recently the sport fishermen were fighting the lower Columbia River gillnetters, in both Washington and Oregon, and it will come up again in this next legislature. The sport fishermen and gillnetters should be working together to get more fish into the river. To the extent that sport fishermen and other groups begin to pull together and work to solve problems of fish production and protection, we're going to be a long way ahead, and the Council's program and state agency programs are going to be stronger.

Q. Is there a role for volunteerism in working on fisheries improvement?

There is a strong and growing role. Oregon Trout and its members are involved in doing stream restoration projects. Such projects increase the awareness of people about how the resource functions, how streams function, what it means to have good habitat, what bad habitat looks like, and how to visualize a healthy stream. That is extremely important.

But in terms of the public volunteering and helping to restore streams that have been damaged by over 100 years of habitat destruction, there is no chance it [restoration solely by volunteers] is going to happen. We've got to get bigger dollars, and we've got to get the agencies that are involved in habitat management to begin not only to protect, but to restore. That is why Oregon Trout is busy working in Washington D.C., on the Forest Service budget, to get more fish biologists and to get more money into the fish program in this area. Through that institutional effort, we are going to increase the protection and improvement of fish habitat on a grand scale, and we're also going to funnel volunteerism through these projects, because they need the manpower to help achieve their objectives.

Q. What directions do we need to head in as a region?

We need to pull the fish and wildlife agencies and tribes together even better than what we have done in terms of cooperative work and restoring the runs. We also need to include the land management and water management agencies in that effort.

So far, we've done a poor job at that. I see the Council as being the primary facilitator for that kind of reorganization of political entities in the basin. It has to go further than just the fish agencies and the power interests. Somehow, we have to get the Corps to play ball and get them to begin doing the job of fish protection at the dams.

Q. What is your prognosis? Are you optimistic that we're going to restore the runs, even given a numerical goal, do we have any chance of getting there?

It is one of those bittersweet things, doing some great things, failing to do others. I am very optimistic about the Council's program, because I've seen it do so much in such a short time. But I am also not optimistic, because I see it getting derailed; because the Council is essentially being led by the fishery agencies and tribes. The Council is relying on the expertise of the agencies and tribes to solve the problems.

If the Council had a geneticist who understood policy and management, rather than just an academic geneticist, we would be a lot further ahead toward laying out a program of research, for instance. That would give us a handle on how to restore the runs with sensitivity to the biological facets of the basin and give us a better chance to reach a sustainable numerical goal.

Q. How do you feel about the Council's proposal to protect critical fish and wildlife habitat from future hydroelectric development?

The protected areas proposal is great. I hope it goes forward as it has been proposed. It has given notice that rivers are no longer just up for grabs. For me, in the public interest arena, it relieves me of a lot of difficulty, because it is very hard to fight case by case the hydro projects that come up.

> **If we can increase the runs by 2.5 million, then we have reached a goal, but have we reached a goal that is going to be lasting?**

We've been, for instance, in the Salt Caves Dam struggle for over four years. It is very difficult, and financially, it is a huge drain.

We can't protect the Council's investment and the investment of the people of the state of Oregon unless we give our rivers distinction and plan hydro development. The protected areas program is extremely vital to the region in order to give us the assurance that we're going to be able to maintain our investments in our rivers and their fish runs.

The problem with the protected areas program, and the problem I see with the Council in general, is that it is not addressing resident fish [non-ocean-migrating fish] to the extent that it should. There is a bias on the Council that anadromous fish are the primary concern. They are no more primary than resident fish. However, it isn't surprising to me that resident fish and wildlife are weak elements in the Council's program, because within the agencies they are weak programs, too. But this will change. ■

A Marriage of Past and Future

New technologies carefully applied make historic structures more efficient than the best buildings being built today.

by Ruth L. Curtis

Designing a new commercial building that is more energy-efficient than almost any existing building is a challenge. Taking an old building with its walls of single-paned windows and archaic heating and cooling systems and turning it into a progressive, energy-saving structure can be a major feat.

That feat was recently accomplished with two historic Portland, Oregon, landmarks—Montgomery Park and the Director Building. These two are now more technologically advanced than most contemporary buildings. Montgomery Park, formerly a catalog distribution center for the Montgomery Ward Company, has been transformed into a world trade center with retail and office space, exhibition halls and restaurants. The Director Building, once a furniture store, is now an office building with retail space on the ground floor. These venerable buildings were winners in the Northwest's Energy Edge competition and are now harbingers of the future of building design.

Energy Edge was a competition to see just how energy-efficient commercial buildings could be. Architects, engineers and developers

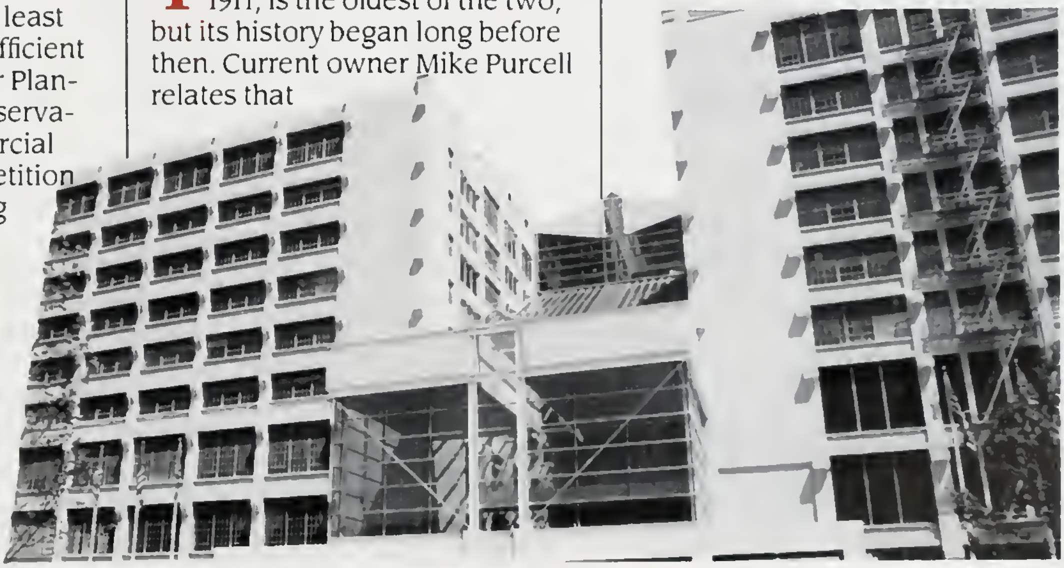
The Director Building in downtown Portland, Oregon, nestles among newer structures.

Photographs by Ruth L. Curtis

were challenged to design highly energy-efficient commercial buildings, and financial assistance from the Bonneville Power Administration paid them to carry out their designs. In addition to providing design assistance, Energy Edge was a research program to gather information on the energy use and actual design and construction costs of state-of-the-art energy-efficient buildings. These buildings are projected to be at least 30 percent more energy-efficient than the Northwest Power Planning Council's model conservation standards for commercial buildings. Now, the competition has ended, but monitoring will continue. The expertise gained will be used to design other conservation programs when the Northwest needs to acquire more energy.

The designers of 29 buildings throughout the Northwest won the competition, earning Bonneville's assistance in implementing the energy-efficiency measures in their buildings. Except for Montgomery Park and the Director Building, all of these were new buildings. But these two are old enough and unique enough to have been placed on the National Register of Historic Places.

The Director Building, built in 1911, is the oldest of the two, but its history began long before then. Current owner Mike Purcell relates that "the site started out as a lumberyard and then, in 1891, a fellow by the name of John Cordray erected a tent on the site and created a 'Musee.'" The Musee featured a clock that played music, gave the time of day in a dozen time zones, and had figures of angels and apostles that appeared when the clock chimed. If the audience became bored with the clock, Cordray also provided vaudeville



Montgomery Park's new entrance, a nine-story glass and steel atrium, meets the National Register standard that it be distinguishable from the existing structure.

acts, live monkeys and other curiosities.

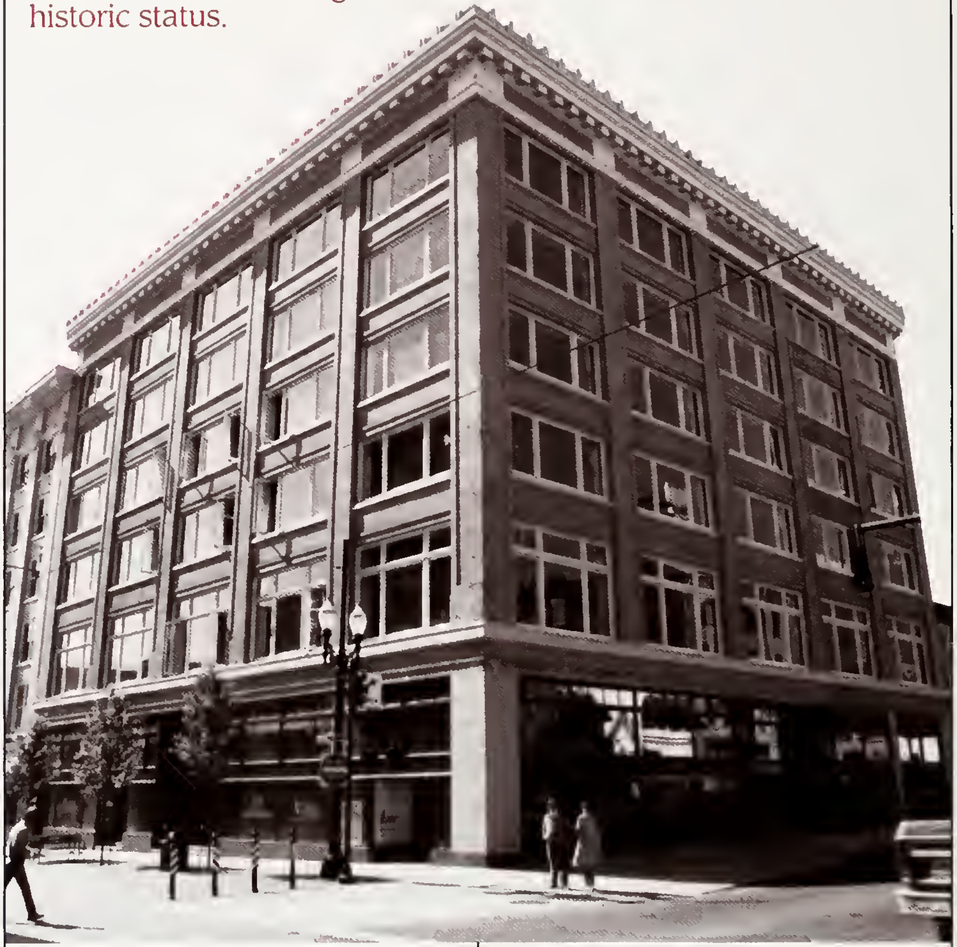
In time, Cordray built a permanent structure that included a successful theater and a saloon. In 1910, the building was declared unsafe and demolished. In its place, a new six-story brick building was built to house the Ira F. Powers Furniture Company. In the late 1950s, Director's Furniture Store moved into the building where it remained until 1985, when the company relocated to the suburbs.

Purcell and his partner, Ken Bakke, bought the building in 1985. They put together plans, began the design work, found some financing and started renovation at the beginning of 1987. Along the way, Purcell heard about the Energy Edge competition. Mike Purcell liked the competitive aspects of the program — "Utilities should do similar programs. It is part of the risk-taking intrigue and excitement of property development that entices a lot of people. They like to take chances and win," he says.

After making the first cut in the competition, Purcell began a series of meetings with Portland Energy Conservation, Inc., which was operating the program in the Portland area. "There were some 500 hours of time that went into these meetings," he relates. "We examined at least 30 different strategies. Some were totally unrealistic. Some products were being misrepresented. But if there was any thought that it could save energy, we investigated it. We pared the list down to about a dozen strategies and submitted it to the competition." The result was that the building made the final cut.

In a way, compared to the new buildings being considered, the historic building was at a disadvantage in the competition, because it first had to be brought up to current energy-efficient practice (where a new building would start), before it could go 30 percent beyond that level.

A penthouse addition on the Director Building is invisible from the street because of the building's historic status.



One of the first measures the owners took to improve the energy efficiency of the building was one that every homeowner knows — they added insulation and weatherstripping. This decreased the air that was escaping or entering through the skin of the building — the building envelope — and allowed the new heating and cooling system to be more effective.

That heating and cooling system is one of many features in the building that are on the leading edge of technology. It is a high-efficiency water-loop heat pump system that moves excess heat from the interior spaces to provide heat at the perimeter. Purcell relates that "we got creative, did a search throughout the whole country and brought in this 30-ton air-to-water heat pump. It's the first one in town." The pump is leased, and the energy savings from the building more than cover the lease payments.

In addition to the Energy Edge requirements, the owners had to deal with the standards for National Register buildings. These limit what can be done to a building and still have it qualify for tax credits for a certified historic rehabilitation.

The shell of the building, the facade, must maintain its original character, and any additions must be distinguishable, so there is no confusion about what is original. This meant that the two-story penthouse added to the building was set back from the edge so it is not visible from the street. It was also built of dissimilar materials. The result is a modern addition on an old building.

Pivoting windows in the Director Building proved impossible to convert to double panes without violating Historic Register rules.

National Register standards also state that if any materials on the facade are replaced, like materials must be used. In the Director Building this caused difficulties with the windows. "We have these huge windows that pivot open. But these darn windows – the sashes weren't such that we could double glaze them. We had to live with them being single-paned windows, but we did weatherstrip them."

The national standards had no impact on upgrading the internal systems of the building. The original builders would never have conceived of a lighting system as extraordinary as the one that was installed in the renovation. In the perimeter areas, daylighting controls turn off the lights when there is sufficient sunlight coming in the windows. Occupancy sensors turn off the lights in rooms that are unoccupied.

And the lights themselves are energy-efficient. Standard fluorescent lamps were replaced with slimmer, more efficient fluorescent lamps. In the corridors and restrooms, compact fluorescent lamps with wattages reduced from 75 to 13 provide adequate light with no sense of dimness. In fact, the lighting in the building's lobby – energy-efficient fluorescent and low-voltage spotlights – recently won an award from the local chapter of the Illuminating Engineering Society.

The result of all this work is that the furniture store has been turned into a very comfortable, first-class office building. The mahogany and granite in the lobby are very businesslike, but touches of whimsey tucked throughout the building – murals in the parking garage painted by local students, ceramic sculptures of familiar Portland faces in the lobby – show that there is more to this building than is first apparent. It has an intriguing history, and yet has met the future with its energy-conserving design.

If the Director Building is comfortable, Montgomery Park is sophisticated and futuristic – a science fiction movie could easily use the building as a set. A nine-story atrium of glass and steel serves as foyer to the huge building two city blocks square. The

Montgomery Park's futuristic interior could be used as the set of a science fiction movie.

size of the building is overwhelming. H. Naito Properties of Portland owns the building, and Bob Naito, the company's vice president, says that it is that very size that attracted the firm to the building. "We decided that because of the volumes of space on the lower floors it would make a hell of a trade show facility. It was bigger than any facility in town, and you could convert that kind of building for less money than anything you could build from scratch."

The building was built in 1920 as a mail-order catalog distribution center for Montgomery Ward. At nine stories and 782,900 square feet, it is the largest historical structure in Portland. "The great story," Naito recalls about the building, "was that the packers who filled the rush orders would roller skate around the building, because it was so huge, and they had to go fast."

The catalog operation was closed in 1982, and Naito properties bought the building in 1984. They hired a local company, Heritage Investment Corporation to get the building listed in the National Register and ensure that renovation work would not endanger the building's tax-credit status. As with the Director Building, the new addition — in this case the atrium — was made of dissimilar materials so that it stands out from the rest of the building. The original building was shaped like a gigantic horseshoe, and the atrium filled in the open end.

Unlike the Director Building, Montgomery Park did not go through the competition to become an Energy Edge building. Instead, the Energy Edge folks approached Naito Properties asking to use the building as a "guinea pig." They wanted to use it to try out all of the regulations and procedures, before the competition actually began.

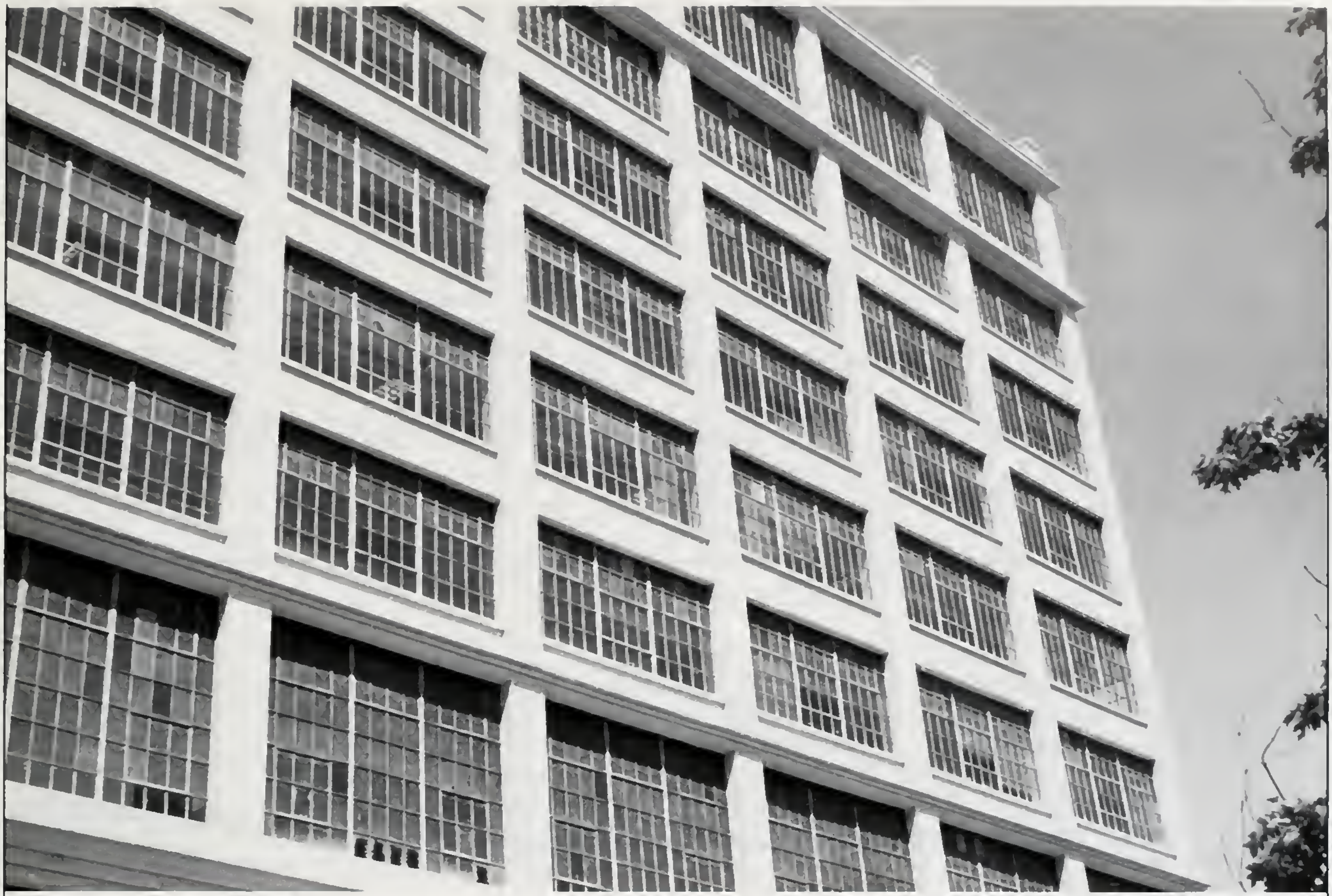
Naito reports that the process was interesting, "because we suddenly found out we should be buying things that we normally won't pay for. But even without the free money from Energy Edge, these things pay for themselves."

The lighting system has particularly impressed Naito. "In the past, you put the lights in, and the lights would throw off heat, so you had to buy more air-conditioning capacity. Now here's a light fixture that produces zero heat and gives off 93 watts of light for every 90 going in. It's like somebody's perpetual motion machine. It defies belief."

One energy-efficient feature of the building was actually installed when the building was first built — the 30,000 tons of concrete that make up the structure of the building. Montgomery Park is basically a huge concrete cube with windows. The concrete has become part of the building's heating and cooling system: it acts as a huge thermal storage system, storing the building's heat in winter and coolness in summer to temper the need for heating and cooling systems.

The heating and cooling system also has more contemporary features, including a variable-air-volume heat pump system in the exhibit halls. In a traditional building, there would be a fan constantly going full speed and the temperature of the output air would be varied. Montgomery Park's system simultaneously varies the temperature of the output air and the amount of air flow. The compressor can be shut off with the air still circulating, and when it is not needed, the circulation can also be shut off. This variability saves electricity by ensuring that only the heating and ventilation actually needed is used.

"Then," as Naito says, "we hooked this whole thing up to a computer." The computer has an energy management system that allows the building operations manager to independently control the heating, cooling and lighting systems for 200 zones in the building. If the sun is warming one side of the building more than another, the computer compensates. Naito says that with most buildings, "the number-one tenant complaint is climate control. But at Montgomery Park, if something goes wrong, the com-



The Department of Interior's National Register standards did have an impact on how Montgomery Park was renovated. Its windows — all 40,000 of them — were replaced one by one with more efficient windows, and each one was hand glazed into its original sash.

puter will pick it up immediately, and the problem will be repaired — often before the tenant is aware of it."

Naito is now using the computer to work out energy-management strategies, "We're trying to figure out when to turn things on and off. How short can you cut the start-up time and still get the building to the correct temperature when the occupants arrive in the morning? With this equipment you can see everything." The system has worked so well that it has been installed in another Naito building.

Through computer modeling, it has been estimated that Montgomery Park's energy saving features will save 3,248,000 kilowatt-hours or $186,500 each year for its owners — that is 32 percent beyond the estimated annual energy savings of the Council's model conservation standards. The smaller Director Building is projected to save 368,852 kilowatt-hours or $18,433 per year — 36 percent beyond the model conservation standards.

Monitoring to see if these savings are actually achieved is the next phase of the Energy Edge program. For three years, these old buildings will be monitored to see if they perform as well as the computer models showed they would.

These landmarks have already had an impact on other buildings in the area. Naito Properties has used Montgomery Park's lighting and energy-management technologies in developing other buildings, without the incentives from Bonneville. The buildings have also proven that it is not only new contemporary buildings that can be made super energy-efficient. With creativity, older buildings can more than hold their own. ■

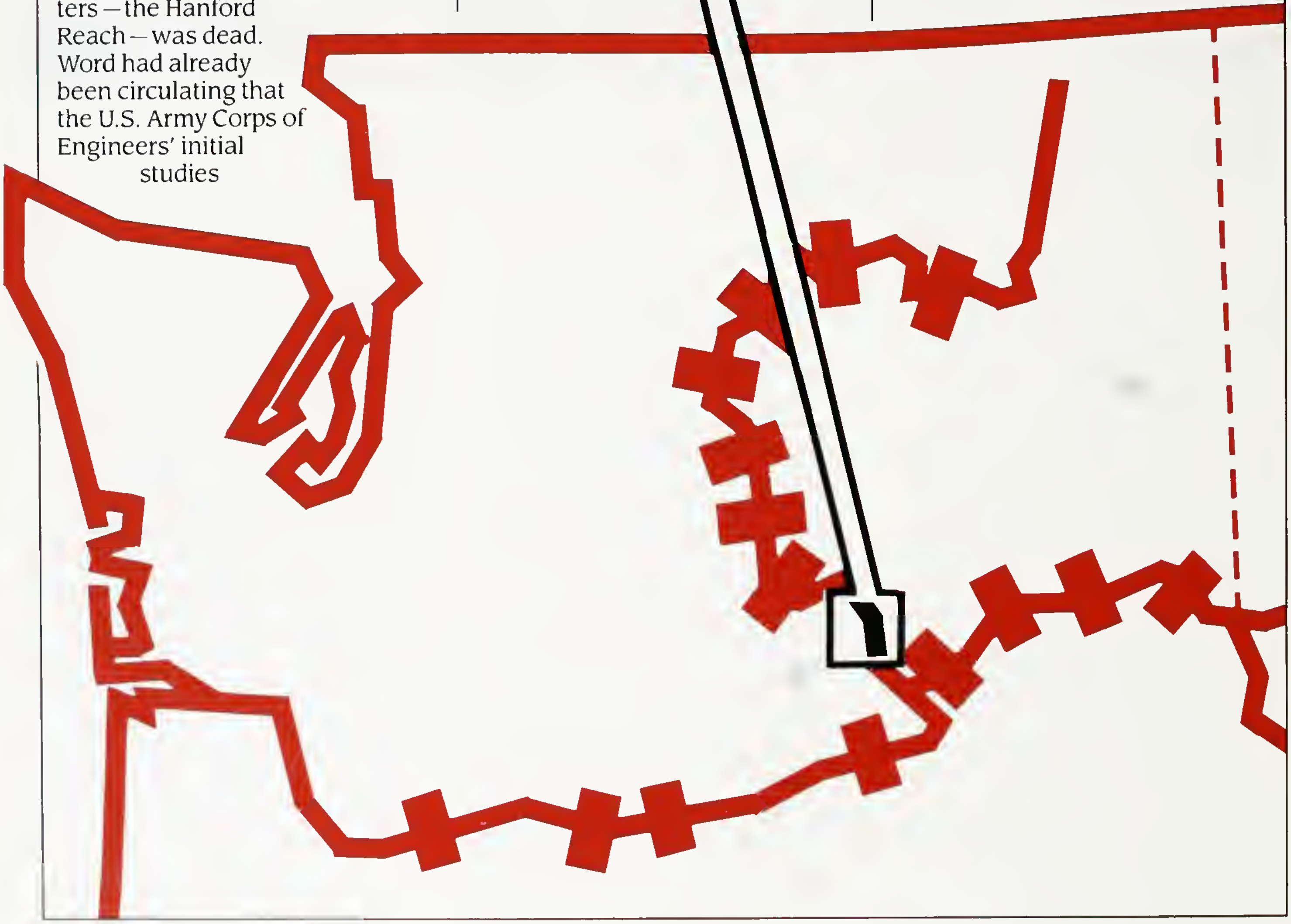
Securing the Last Reach

The Corps of Engineers continues to study the much-opposed dredging of the last open stretch of the Columbia.

by Carlotta Collette

Nearly everyone thought the plan to carve a navigation channel through the Columbia River's last untrammeled waters — the Hanford Reach — was dead. Word had already been circulating that the U.S. Army Corps of Engineers' initial studies indicated the faulty economics of the scheme. No dollar-for-dollar returns on investments could be squeezed out of the project's anticipated profits to upriver counties.

Furthermore, virtually every



Map by Stephen Sasser

The Hanford Reach is the only remaining salmon and steelhead spawning habitat on the mainstem of the Columbia ... the Corps' dredging proposal could destroy 47 percent of that spawning area.

environmental group in the Northwest, Columbia Basin Indian tribes, fishing organizations, archaeologists, fish and wildlife agencies, legislators and others, including members of the Northwest Power Planning Council, were all squarely aligned against the idea because of the harm it could inflict on fish, wildlife and other resources.

So, it was with some shock that the Council at its May meeting in Richland, Washington, heard Corps' representative Noel Gilbrough quietly explain that the scheme to dredge the Hanford Reach is still in the works.

The Hanford Reach is that piece of the Columbia running from Priest Rapids Dam, at about river mile 400, to the top of the pool behind McNary Dam, near Richland, Washington. It is bordered on land by the U.S. Department of Energy's Hanford Nuclear Reservation.

The reach was spared development by the Corps of Engineers as recently as 1979, when the proposed Ben Franklin Dam was scrapped. That dam would have buried the Hanford Reach behind a reservoir and navigation lock that would have accomplished what the Corps is now proposing.

This time the engineers want to dredge portions of the reach, creating a deep enough channel to eventually move some of the world's largest barges between the lower Columbia and Wenatchee, Washington. Project supporters believe the navigation plan would open that city and surrounding Chelan County to broader markets for the area's lumber, aluminum and agricultural products.

The dredging scheme, part of the Corps' long-term Mid-Columbia Navigation Proposal, would include a series of lifts or cranes on gantries, instead of navigation locks, to help the huge barges up the elevation changes along the reach. The Corps estimates the expense of such a system to be between $100 million and $200 million. But that figure does not reflect the ecological impacts of relocating nearly a million cubic yards of river bottom in a delicately balanced environment.

It is easy to imagine the Columbia River before development. Old photographs depict its rough current and breathtaking canyons. There were river reaches where the walls on either side came close together and the water was squeezed down through a tight chute. There were stretches where the land slid back from the river, flattened out and baked dry. Around the big corner in the river, above where the Snake came pouring in from its long fall through Idaho, there was a smooth run of the Columbia that had broad, shallow beaches, tall white bluffs and low gravel bars scattered with rocks the size of a big fist.

Most of the steep-walled canyons are just deep pools now, backed up and spread out behind thick concrete walls. Water no longer falls off cliffs submerged beneath the surface of reservoirs. In the river's whole 650-mile run through the United States, only one slender measure remains intact, the roughly 50-mile long reach known as Hanford.

Home to more than half of the fall chinook salmon returning up the Columbia to spawn, most notably the wild run of prized fish called "upriver brights," the reach figures heavily in the U.S. and Canada Pacific Salmon Treaty governing ocean harvests and increased production of salmon and steelhead. The reach is also an important piece of the Council's Columbia River Basin Fish and Wildlife Pro-

Project supporters believe the navigation plan would open Chelan County to broader markets for the area's lumber, aluminum and agricultural products

gram effort to double salmon and steelhead runs in the Northwest. It is, in fact, the only remaining salmon and steelhead spawning habitat on the mainstem of the Columbia.

Tony Eldred, eastern mitigation coordinator for the Washington Department of Wildlife, estimates that the Corps' dredging proposal could destroy about 47 percent of the salmon and steelhead spawning areas along the reach. The department considers this a conservative estimate, difficult to measure clearly because it is difficult to imagine what the Corps will do with the million cubic yards of rocks scraped from the river bottom.

One million cubic yards of gravel would look like 200, 3-foot-thick football fields laid end to end. It is hard, reasons Eldred, to conceive of any portion of the reach where such a mass of stone could be deposited without tremendous environmental consequence.

If they use the rocks to build new spawning habitat in the area of the reach, they will need to build nearly three dozen new environments to replace the one they disrupt. That assumption is based on the unlikely premise that the Corps' new spawning environments outperform every other such experiment ever attempted in the Columbia.

A similar project, just upriver from the reach – the China Bar spawning channel built by the Grant County Public Utility – has been only marginally successful in attracting about 40 chinook spawners to build their nests (called redds) each year. On the Vernita Bar, adjacent to the Corps' proposed navigation channel, the unimproved natural spawning gravel hosts up to 100,000 spawners annually.

Besides the recuperating run of fall chinook, the reach provides a comparatively safe environment for 13 species of animals and nine species of plants classed by federal and state authorities as "endangered," "threatened," or "of concern." "The character of the Hanford Reach," argues Eldred, "governs what is present; change its character and you change what is here, whether rock or mud, plant, fish, wildlife or man."

For security reasons, access to the reach has been restricted since 1943, when the towns of White Bluffs and Hanford were abandoned to make room for the nation's first plutonium production plant. By restricting access, the department coincidentally deterred vandalism at archaeological sites and areas of cultural and spiritual importance to Indians along the reach. The Yakima and Wanapum Indians, whose ceded lands include the reach, and other Columbia Basin tribes, are on record as strictly opposed to any plans to disrupt these last sacred holdings.

The uniqueness of the Hanford Reach led, as early as 1972, to its being identified by the U.S. departments of the Interior and Agriculture as one of 47 rivers nationwide to be studied under the nation's Wild and Scenic Rivers Act. In 1982, the reach was placed on the nationwide rivers inventory list prepared by the Department of the Interior.

Now, Washington senators Dan Evans and Brock Adams and Congressman Sid Morrison have introduced legislation to follow up on the Interior Department's interest in the reach. The legislators are asking that the reach be studied for inclusion in the Wild and Scenic Rivers System, and that a moratorium on all development await the findings of that study and subsequent legislative action. As passed out of the Senate and discussed in the House, the bill would halt the Corps' plans for at

The reach provides a comparatively safe environment for 13 species of animals and nine species of plants classed as "endangered," "threatened," or "of concern."

least eight years—three years to complete the study and another five to complete actions in response to the study.

So, with all this resistance, who stands to benefit if the Corps proceeds? Certainly the Port of Chelan County, at Wenatchee, Washington, is interested in the barge channel. It would cost the county next to nothing (the work would be taxpayer funded) to gain access via barge transportation to the shipping center at Portland, Oregon, and on to the world's markets. The Corps' innovative lift system for moving the barges, seen otherwise only in Europe, could also become a tourist attraction.

Washington State Senator George Sellers, who works for the Port of Chelan, has been promoting the navigation project. Sellers explained to the Council that Chelan County "wants to be a good neighbor to the reach." He argued that the project can be compatible with the environment and the fishery in that area, even possibly enhancing the fishery.

"We know that the days of doing public projects just because they're there are gone, and they probably should be," he said. "So we do have to prove the economics of the project, and that will be done in the next few months. The economic studies are not that favorable," he added. "We have to be honest about that."

"We are looking at the economics of it," echoed Noel Gilbrough, the Corps' study manager on the reach, "and they don't look that good. We see some opportunities possibly to increase the benefits, but there would have to be significant increases in the benefits as we see them now. But we are not killing the project yet."

Keeping the reach-carving plan alive will gain the Corps few friends on the Council. Washington Council Member Tom Trulove is outspoken in his opinion of the proposal. "Why the Corps would even propose such a thing in the face of such obvious opposition, is a mystery," he asks. "To attempt such an enormous upheaval in our last pristine piece of the river, borders on the irresponsible."

While the Corps reworks its numbers, the reach's defenders converge on Congress, pushing for the legislation that will at least stall the Corps mid-stream. ■

Fist-sized gravel on the Vernita Bar annually hosts more than 100,000 spawning salmon and steelhead.

Photograph by Carlotta Collette

Puget's Big Plus

Washington's largest investor-owned utility is turning to conservation to help meet its new power needs.

by Carlotta Collette

The service district of Puget Sound Power and Light Company wraps around the city of Seattle, but does not include it. Eight counties in western Washington and part of Kittitas County in central Washington are served by the investor-owned utility, which is the largest in the state of Washington. More than 1.5 million people buy their electricity from Puget Power, fully a third of the state's citizens.

And while most of the Northwest is experiencing a surplus of electricity, Puget's rapidly growing customer base (arguably the fastest growing in a generally slow-growing region) and limited generating resources have already forced the utility to purchase two-thirds of its needed power from other

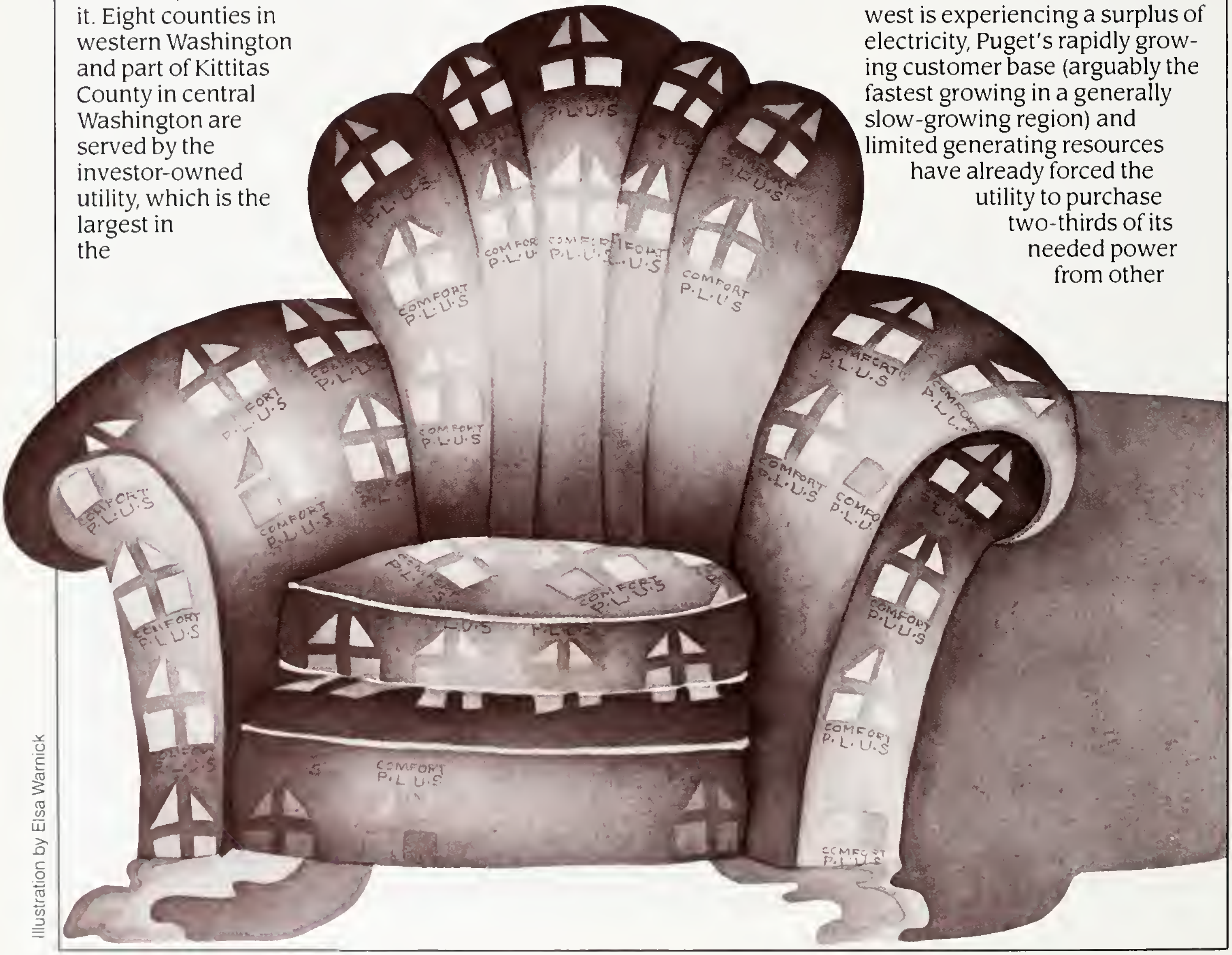


Illustration by Elsa Warnick

utilities. Given the Northwest's cheap power rates, Puget is not considering its deficit to be a plight – right now. "We're buyers in a buyers' market," says David Hoff, the company's director of market planning and forecasting.

But, as new buildings go up, utilities like Puget, which lack the independence enjoyed by utilities that generate all their own power, will be trying to meet the growth in their future electrical needs by making very efficient use of what they have.

Enter the impetus for "Comfort Plus," Puget Power's program to achieve the energy savings of the Northwest Power Planning Council's model conservation standards. The Council designed the standards to cut energy use in new electrically heated homes by as much as 60 percent. Working with the Bonneville Power Administration, the Council recommended programs to help utilities garner those savings in as many new homes in their service districts as possible.

Bonneville's program, called Super Good Cents, markets this more "centsable" approach to managing utility and regional electrical load growth. The Council figures that if enough new homes and commercial buildings are made to be as efficient as is cost-effective, the Northwest can stave off the need to develop new generating resources that cost more than twice as much as conserved energy.

That reasoning was not lost on Puget Power. But rather than borrow Bonneville's Super Good Cents program, Puget met with builders and others in the housing industry and developed an alternative program to achieve the savings of the model standards in ways tailored to that community.

A by-product of these meetings was Puget's development with a local window manufacturer of efficient windows that incorporate controllable vents. These vents improve indoor air quality in houses without the necessity of cutting additional vents in the structure's walls.

Puget wants these homes to be quieter, cleaner, brighter, more comfortable, and with lower energy costs than anything else on the market.

The Puget program is designed to be in effect until Washington's state building codes match the energy savings of the Council's standards. Currently the state is closer than any other Northwest state, but Puget's program is a challenge to move the codes all the way to super efficiency.

Bonneville encourages super efficient new construction by providing marketing and technical assistance to participating utilities and building professionals and by offering financial payments for each electrically heated housing unit that meets the model conservation standards. Puget matches Bonneville's payments to a total of $1,000 for each home or $1,000 for the first unit of a multifamily building and $250 for each additional unit.

Puget estimates that its expenditures for the Comfort Plus program, roughly $2.5 million in 1988 (half of which is reimbursed by Bonneville) for 2,800 housing units, will be more than offset by the benefits of the program.

Puget provides partial incentives to builders who only go part of the way to the model standards. "Some of our builders had problems with Bonneville's 'all-or-nothing' approach," explains Hoff. So Puget, concerned that not enough builders would participate in too rigid a program, offered them the opportunity to take less than the whole package. "But almost all the buildings so far have gone the whole distance to the model standards," he adds, and the utility is seeing more super efficient electrically heated homes built than it anticipated.

Movement toward efficiency on Puget's part is critical to regionwide acceptance of more efficient building codes – the Council's ultimate conservation goal – because more than a third of the region's new construction over the last four years occurred in the Puget Power service area. Conservation in Puget's service area translates into considerable energy savings, more predictable future electrical requirements, and tempered seasonal fluctuations in electrical use for Puget and the region as a whole.

But, clearly, the big winner in Puget's program is the new homebuyer living in a Comfort Plus home. Puget wants these homes to be "quieter, cleaner, brighter, more comfortable, and with lower energy costs than anything else on the market," according to its marketing material. Puget's homes will use about half the electricity that electrically heated homes built to current state codes require. And the utility expects few complaints from Comfort Plus home owners because their bills will be lower, and all of the home's energy components are covered by a Comfort Plus warranty.

In 1987, Puget completed the first step in its ongoing Demand and Resource Evaluation (DARE) project. The project relies on a public review and comment process to help the utility expand its view of which resources could be counted on to meet future power needs at the least possible cost. In response to the report and the comment it received, Puget has kicked off what it considers to be "one of the most aggressive energy efficiency and weatherization programs in the country." Comfort Plus is the headliner in that list of programs. ■

SHORTS

The town of Cathlamet, Washington, was honored for its leadership in achieving energy efficiency by the Northwest Power Planning Council and the Bonneville Power Administration. Cathlamet has been a pioneer in promoting the Council's model conservation standards for new electrically heated housing. The city adopted the standards into its building codes in 1986.

Portland General Electric is offering a money-back guarantee to owners of the utility's "Good Cents" homes, if they cost more to heat than is advertised. The Oregon utility, confident that its super energy-efficient homes will require only $270 a year to heat (for homes that are less than 1,500 square feet — larger homes have higher heating bills), promises to pay the excess fuel bills back to the homeowner. The homes are designed to meet the Council's model conservation standards for efficiency, and they have been demonstrated to cost from 30 to 50 percent less to heat than homes built to Oregon's current building codes. The pay-back program only applies to homes heated with heat pumps or zonal electric heating systems. (For more information, contact: Michael Tevlin, Portland General Electric Company, 121 S.W. Salmon Street, Portland, Oregon 97204, 503-220-4534.)

Spring chinook returned this year to the Umatilla River Basin in northeastern Oregon for the first time in 60 years, say representatives of the Columbia River Inter-Tribal Fish Commission. The chinook are the first adult returns from young chinook released into headwater tributaries of the river two years ago by the Umatilla Tribe and the Oregon Department of Fish and Wildlife. The tribe has been trying to recover these runs as part of the Columbia River Basin Fish and Wildlife Program.

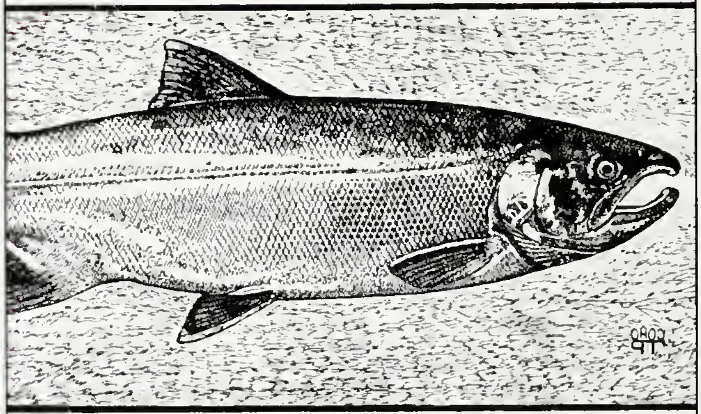
U.S. energy consumers could save more than $15 billion over the next 25 years using new energy-efficient fluorescent light fixtures called for in a bill passed by the Senate this spring. The bill would require new fluorescent light balasts — the part of the unit that ignites the bulb — to meet strict energy-efficient standards comparable to those adopted in California, New York, Connecticut, Florida and Massachusetts. A major advantage of the legislation would be manufacturers only having to produce one standard of fixture nationwide. (For more information, contact: Jim Spellman, Colorado Senator Tim Wirth's office, U.S. Senate, Washington, D.C. 20510, 202-224-5852.)

Action on Protected Areas Designations

In April, the Northwest Power Planning Council released for public comment a proposal that would protect roughly 43,000 miles of Northwest streams from future hydroelectric development. The streams contain critical habitat for salmon and steelhead, resident (non-seagoing) fish and other wildlife, and new hydropower projects could cause irreparable harm to this habitat.

The Council published a list of these stream reaches and a draft of the proposal in October 1987. More than 400 individuals and groups commented on this early draft. These comments have been considered in developing the proposal that was released in April.

The Council held public hearings on the proposal in each of the four Northwest states (Idaho, Montana, Oregon and Washington) in May and June. Additional public comment in writing was taken through July 8, 1988. The Council is expected to take final action on the proposal, which would result in amendments to both the Columbia River Basin Fish and Wildlife Program and the Northwest Power Plan, at its August Council meeting in Kalispell, Montana.



CALENDAR

August 10-11 — Northwest Power Planning Council meeting at Cavanaugh's Motor Inn in Kalispell, Montana.

September 26-29 — "Northwest Energy Connections '88," at the Sea Tac Red Lion in Seattle, Washington. Sponsored by Puget Power, in cooperation with the Bonneville Power Administration. For more information: TLA Marketing Services, 10020A Main Street, MS443, Bellevue, Washington 98004, 206-455-9917.

September 14-15 — Northwest Power Planning Council meeting at the Owyhee Plaza Hotel in Boise, Idaho.

October 1 — "Sustainable Energy: From Possibility to Reality," at the Greenwood Inn in Beaverton, Oregon. Sponsored by the Solar Energy Association of Oregon. For information: Solar Energy Association of Oregon, 2637 S.W. Water Avenue, Portland, Oregon 97201, 503-224-7867.

October 12-13 — Northwest Power Planning Council meeting in Missoula, Montana.

October 24-27 — Fisheries Bioengineering Symposium at the Columbia River Red Lion in Portland, Oregon. Sponsored by the American Fisheries Society. Cosponsored by the Northwest Power Planning Council. For more information: Victor Kaczynski, CH_2M Hill, 503-224-9190.

November 8-9 — Energy EXPO '88, a trade show and conference for gas and electric energy conservation for commercial and industrial uses, in Milwaukee, Wisconsin. For more information: Kevin S. Anderson, Energy EXPO '88, ANCO, Public Service Building, 231 W. Michigan, Room 226, Milwaukee, Wisconsin 53201, 414-221-4801.

November 18-19 — "Celebrate America's Rivers," a national conference in honor of the 20th anniversary of the national Wild and Scenic Rivers System, in Alexandria, Virginia. For more information: Suzanne Wilkins, Kevin Coyle, or Ken Olson, American Rivers, 202-547-6900.

November 29-December 3 — "Housing for the 90s" at the Sheraton Tacoma Hotel, Tacoma, Washington. Sponsored by the Energy Business Association. For more information: Patricia Anderson, Energy Business Association, 420 Maritime Building, 911 Western Avenue, Seattle, Washington 98104, 206-622-7171.

A more detailed calendar of Council committee meetings and consultations is carried each month in *Update!* See order form on back cover.

Compiled by Ruth L. Curtis

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The Northwest Power Planning Council is required to develop a program to restore the Columbia fisheries and a regional electric energy plan, to be carried out by the Bonneville Power Administration, emphasizing cost-effective conservation and renewable resources.

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Art Director: Stephen Sasser
Special Departments Editor: Ruth Curtis
Production: Marty Todd

COUNCIL PUBLICATIONS ORDER FORM

Please send me a copy of the following publications of the Northwest Power Planning Council. (Note: not all publications are available immediately, but they will be sent to you as soon as possible.)

Publications

- ☐ 1987 Columbia River Basin Fish and Wildlife Program
- ☐ 1986 Northwest Power Plan
- ☐ (88-9) Proposed Amendment Regarding Protected Areas
- ☐ (88-18) Analysis of the Corps of Engineers Study of Mainstem Bypass Facilities
- ☐ (88-19) Supplementation Research Proposed Five-Year Work Plan

Papers Regarding the Technical Update to the 1986 Power Plan

- ☐ (88-2) Plans for a Technical Update to the 1986 Power Plan
- ☐ (88-13) Conservation Resources for the 1988 Power Plan Update
- ☐ (88-14) Cost and Availability of New Generating Resources
- ☐ (88-15) Revised Draft: Economic, Demographic and Fuel Price Assumptions
- ☐ (88-16) Revised Draft Forecast: Demand for Electricity in the Pacific Northwest
- ☐ (88-17) The Role for Conservation in Least-Cost Planning

☐ Western Electricity Study briefing papers:

- (87-3) Western System Overview
- (87-4) Electricity Use in the Western U.S. and Canada
- (87-7) Existing Generating Resources (draft)
- (87-13) Future Resources (draft)
- (87-14) Interregional Transactions
- (88-3) Load/Resource Balances (draft)

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- ☐ *Northwest Energy News* (this bimonthly magazine)
- ☐ *Update!* (monthly public involvement newsletter that contains the Council meeting agenda and a more detailed publications list)

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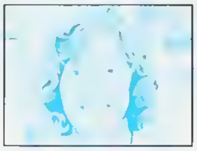

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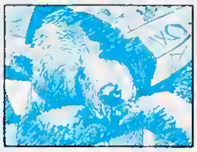

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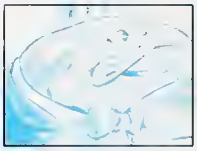

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Editor's Notes

In some ways, this is a special issue of Energy News. It was not intended. It just happened that over the past few months, the Council has heard some particularly provocative and eloquent public comment. We wanted to share some of it with our readers. Find it beginning on pages 7 and 22.

This issue is also special because it introduces Gordon Lee, our new writer, stolen away from the *Puget Sound Business Journal*.

And finally, with this issue we say goodbye to our Idaho contributor, Beth Heinrich, who has left the Idaho Council office for new career opportunities.

Between this and our next issue, all Energy News readers will be sent our 1988 Annual Report to Congress. We've had an exciting year. Read all about it.

Cover illustration is by Joan Barbour

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NEW Generation Generation

Illustration by Lynn Carson

by Gordon Lee

New technologies could give a 6,500-megawatt jolt to the Northwest's energy future.

The Northwest could obtain as much as 6,500 megawatts from new technologies and conservation by the year 2005, a Northwest Power Planning Council staff analysis predicts.

Under certain demand and price conditions, that electricity—enough to power seven cities the size of Seattle—could supply nearly a quarter of the region's energy needs by that year. Demand for energy in the Northwest could hit 26,101 megawatts in 2005, up from 14,593 megawatts in 1983, according to the Council's high-growth forecast for electricity consumption.

Those estimates come from the update — still in draft form — of the 1986 Northwest Power Plan that the Council has undertaken this year. In its revision of the technical analysis of the power plan, the Council increasingly is looking to new technologies and conservation measures as ways the region can meet growing demands for electricity from residential, commercial and industrial customers. Such steps will allow the Northwest to obtain power without having to build costly coal-fired electric plants or buy expensive power from other regions.

Those steps include new conservation measures, improved methods of transmitting and distributing electricity, better regulation of the voltage utilities send down their lines and new technologies that allow power to be produced more efficiently from natural gas-driven turbines or as a by-product of other industrial processes.

This isn't the first time the Council has tried to identify new sources of energy for the region. More than two years ago, the Council cataloged a wide array of potential resources for the region in its 1986 Power Plan. Since then, however, the economics of the energy industry have changed dramatically — oil and gas prices have plummeted, coal prices have flattened and some alternative energy sources — such as wind generation — have lost some of their economic luster.

Advances in energy technology also have made several generating resources more attractive today than two years ago. The industry's understanding of transmission and distribution technology has improved since 1986. So, too, has the understanding of the ability of utilities to control the voltage they send to customers. Technologies that allow utilities to produce electricity from gas-fired turbines have improved, as have those that enable industries to generate power from cogeneration plants.

Over the next few months, the Council will examine how these technological advances will change the region's resource portfolio. The portfolio is a schedule that shows what new resources the Council believes utilities should bring on line and when. Its estimate of the most cost-effective resources for the Northwest take top billing in the portfolio. Here's a rundown of major improvements over the past two years that could have the biggest impact on the Council's portfolio and its 20-year picture of the region's energy mix.

The drop in natural gas prices over the past two years has made cogeneration a more affordable option for many smaller businesses.

Transmission and distribution improvements

Because of old and inefficient equipment, the Council estimates that about 7.5 percent of the electricity sent on power lines in the Northwest disappears during transmission. That represents some 1,300 megawatts of lost energy during the 1988-89 operating year.

However, the region's utilities and the Bonneville Power Administration might be able to recapture as much as 355 megawatts of those losses by using more efficient transformers, conductors, power lines and other new equipment, according to analysts at the Council. That much power could be recaptured at a cost of 5 cents per kilowatt-hour or less, which is the cost of building a medium-sized coal-fired electric plant. (Because of the West's large, relatively inexpensive supply of coal, these thermal electric plants are the benchmark against which the Council judges other new resources to test cost-effectiveness.)

"This is a much larger resource than we thought two years ago," said Jeff King, senior resource analyst at the Council. "Lots of these savings are available at fairly low cost. They're very attractive."

Based on a recent Bonneville study, the Council revised its estimate of the amount of savings that might come from improvement of conventional, proven transmission and distribution equipment.

That study, completed in 1987, also spotlighted several technological advancements that weren't included in the Council's estimate of power that potentially could be recaptured. New metals could go into transformers, the devices that change the high voltage needed to send electricity over long distances into lower voltage current used by customers, Bonneville officials said. Insulators, the glass cylinders that keep high voltage wires from being grounded by power poles and towers, could be enlarged and made from new ceramics.

Steps to recapture power lost during transmission and distribution are attractive because they are cheaper than most other efficiency measures available to utilities, King said. Nearly two-thirds of the savings — 237 megawatts — would cost 2 cents per kilowatt or less, he estimated.

In addition, unlike other efficiency moves that end up cutting customer demand for kilowatts, transmission and distribution improvements don't squeeze utilities' revenues. Rather, the steps cut the amount of power utilities need to buy or produce, which means that their profit margins should improve.

Most of the steps wouldn't disrupt normal utility operations because they could be accomplished as part of normal maintenance procedures. However, if they're not put into utilities' maintenance schedules, the measures represent a lost opportunity they won't be able to exploit until crews return to those lines.

Conservation voltage regulation

Council analysts figure that utilities in the region could save some 200 megawatts by better regulating the voltage that customers receive.

Most appliances and other electrical equipment in the United States are rated at 120 volts or 220 volts and work best when they receive close to, or slightly less than, that level of power. They lose efficiency when they get too much juice.

But, because of losses that occur as electricity moves over long distances, utilities have traditionally been unable to supply all customers with a constant level of voltage. Some utilities have had to turn up the dial on their voltage regulation equipment so that their most distant customers can receive at least 114 volts, the minimum national standard for a 120-volt circuit. As a result, customers located close to transformers sometimes receive as much as 126 volts, while other customers' voltage drops in proportion to their distance down the line.

However, recent improvements in voltage regulation equipment mean that less voltage might be lost along power lines. That will allow utilities to lower the voltage they send from transformers, with the result that appliances will operate at the lower, more efficient end of the standard voltage range.

Compared with other potential sources of power, voltage regulation is inexpensive, King said. Most of the measures can be undertaken in small steps and don't require much preparation. More than 75 percent of that power could be saved at 1 cent a kilowatt or less, with half of it costing no more than 0.5 cents a kilowatt.

But utilities might resist some of those steps. Customers complain about flickering lights and television screens whenever their voltage drops too low and, as a result, might want to go slow on any voltage reduction effort. Moreover, by allowing customers' appliances to operate more efficiently, voltage reduction programs will eat into customer demand, which may dampen utilities' enthusiasm for the steps.

Cogeneration

Cogeneration — the simultaneous production of electricity and heat — has been around for years. Industries have produced power as a by-product of their ordinary operations or have captured and reused heat from generating power at their own small facilities for nearly a century.

Use of the resource in the United States peaked in 1950, when cogeneration supplied 15 percent of the nation's electricity. It fell after that as utilities moved to larger, more efficient power plants.

But Council studies suggest that it may resurge, thanks to new technologies and lower natural gas prices that have emerged during the past two years.

Where, in the past, cogeneration facilities were custom-built for large industrial and commercial operations, new generation equipment that manufacturers have introduced in the past two years is modular, King said. Modular construction lowers the cost of cogeneration equipment and allows it to be adapted easily to small and medium-sized operations. "Now, there are packaged, off-the-shelf plants that are as small as 65 kilowatts," he said.

In addition, the drop in natural gas prices over the past two years has made cogeneration a more

Coal gasification means that utilities might be able to switch between natural gas and synthetic, coal-derived gas to produce electricity.

affordable option for many smaller businesses, King added. Since the newest cogeneration facilities are primarily electric generators that run on natural gas, any energy price drop makes the resource more economically attractive to businesses.

Recent Bonneville studies estimate that cogeneration could supply Northwest utilities with nearly 1,650 megawatts of energy. That's more than double the potential output of the region's 790 megawatts of cogeneration capacity today, only a fraction of which is sold to utilities. That additional power would cost 5 cents a kilowatt-hour or less, meaning that it would be competitive with the price of new coal-fired generating plants.

Based on interest in cogeneration in California and elsewhere, that estimate might be low. But cogeneration is highly cost-sensitive. Even though it may be less expensive than electricity from coal, cogeneration doesn't come cheap. The Bonneville study suggests that few industries could afford to sell cogenerated power for less than 2.5 cents a kilowatt-hour. Most of the region's potential from this resource would cost more than that to develop, which means that private industries would enter into cogeneration production only when they could sell their power to utilities a 3 cents to 5 cents a kilowatt-hour.

Combustion turbines

While the region historically hasn't relied to a great extent on natural gas to produce electricity, lower gas prices since 1986 and new technologies have prompted the Council to review its estimate of the role gas-fired simple- and combined-cycle combustion turbines might play in the region.

In basic terms, combustion turbines are natural gas-fired jet engines that drive electric generators. Simple-cycle units run turbines directly, while combined-cycle units use the waste heat from an initial combustion turbine to run a second steam turbine. If they aren't used much, simple-cycle turbines are the more economical of the two technologies, but at higher levels of use, the more thermally efficient combined-cycle units become more cost-effective. The region today has about 1,190 megawatts of combustion-turbine capacity, mostly from simple-cycle units.

The draft power plan update suggests the Northwest might be able to plug into as much as 1,000 megawatts of electricity produced by simple-cycle combustion turbines and 2,000 from combined-cycle units. Utilities would use these turbines principally during periods of peak demand or during poor water years when the region's hydro system can't handle the load. Those units — which are expensive to run full-time — would lie idle during average and good water years.

Over the past two years, manufacturers have developed more efficient versions of both turbines than those the Council considered in 1986. They use less fuel and produce more power than older models, according to King.

As a result, the Council is taking a second look at combustion turbines' role in the region. But while the new technology looks promising, the resource's weak link may be the capacity of the natural gas pipeline network in the Northwest. The current system may not be suited to deliver large volumes of gas to new combustion turbines.

In addition, the resource poses steep environmental challenges. Combustion turbines are noisy. And their use of natural gas — one by-product of whose combustion is carbon dioxide — may add to depletion of the earth's ozone layer and to global warming trends.

Coal gasification

Over the past two years, advancements in this technology — which allows utilities to squeeze synthetic gas from coal — have prompted the Council to consider adding it to the region's resource portfolio.

Where combustion turbines traditionally have relied on natural gas and fuel oil as their energy sources, coal gasification means that utilities might be able to switch between natural gas and synthetic, coal-derived gas to produce electricity. "The technology provides an added layer of protection in times of an energy squeeze," King said. "It provides fuel flexibility."

Gasification is attractive to utilities because the technology can be added to existing combined-cycle units. That means utilities can invest in the technology in stages, governed by electricity demand and the relative costs of natural gas and coal.

Gasification also allows utilities to use coal without the high levels of sulfer dioxide and other emissions they have had to contend with out of direct-fired coal plants. Gasification extracts synthetic gas as coal is burned under controlled, low temperatures, which results in cleaner by-products. "Gasification is more environmentally sound than a coal plant, which tries to clean up gas going out the stack," King said. "With coal gasification, the synthetic gases are cleaned prior to the point of combustion."

A combined-cycle combustion unit tied to a coal gasification plant likely would be as large as a medium-sized coal-fired electric plant, he said. However, the technology is expensive: gasification units come in above the 5 cents per kilowatt-hour, which is the estimate for the cost of building a new coal-fired plant. ■

Beyond Reach

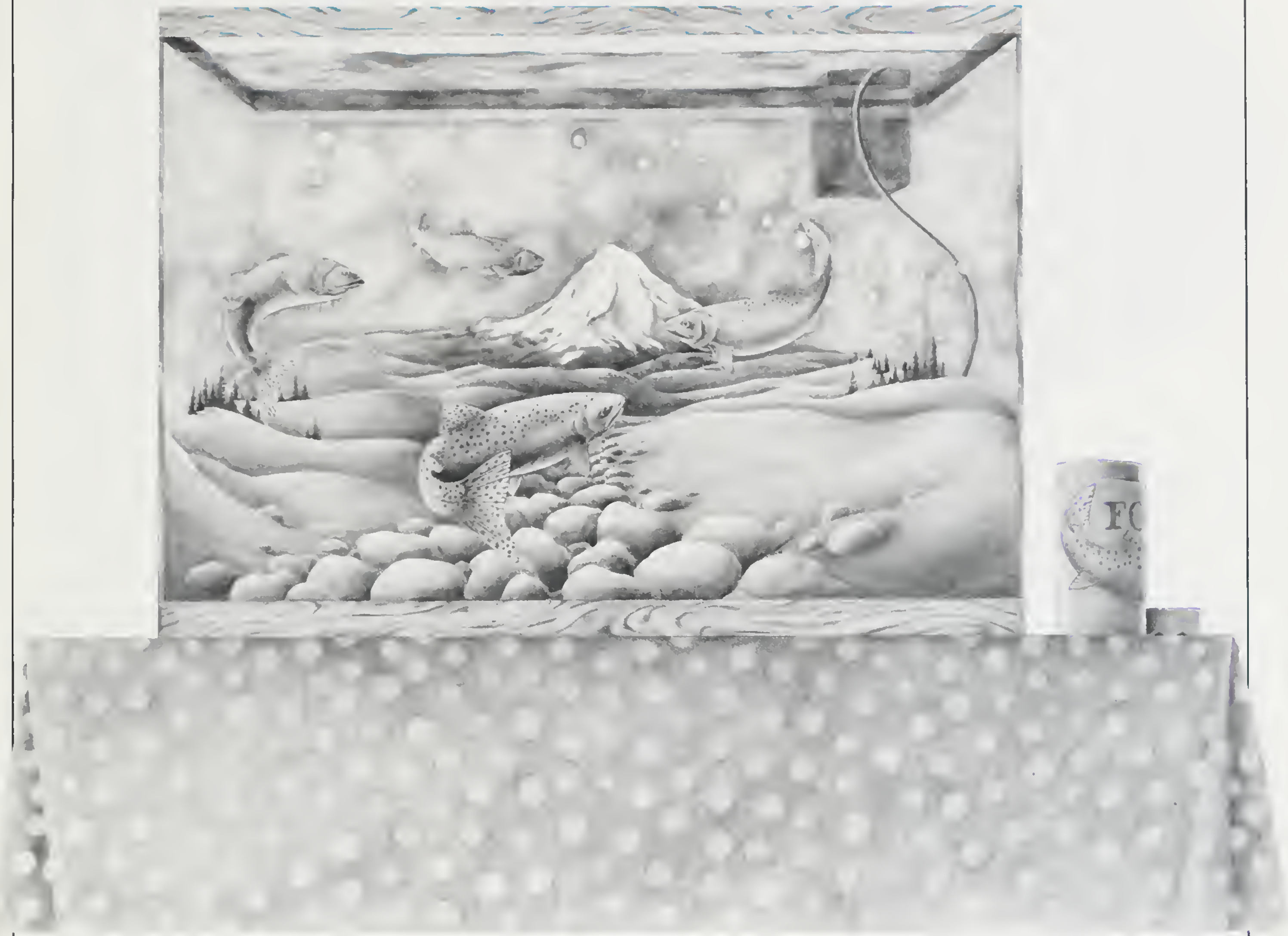


Illustration by Joan Barbour

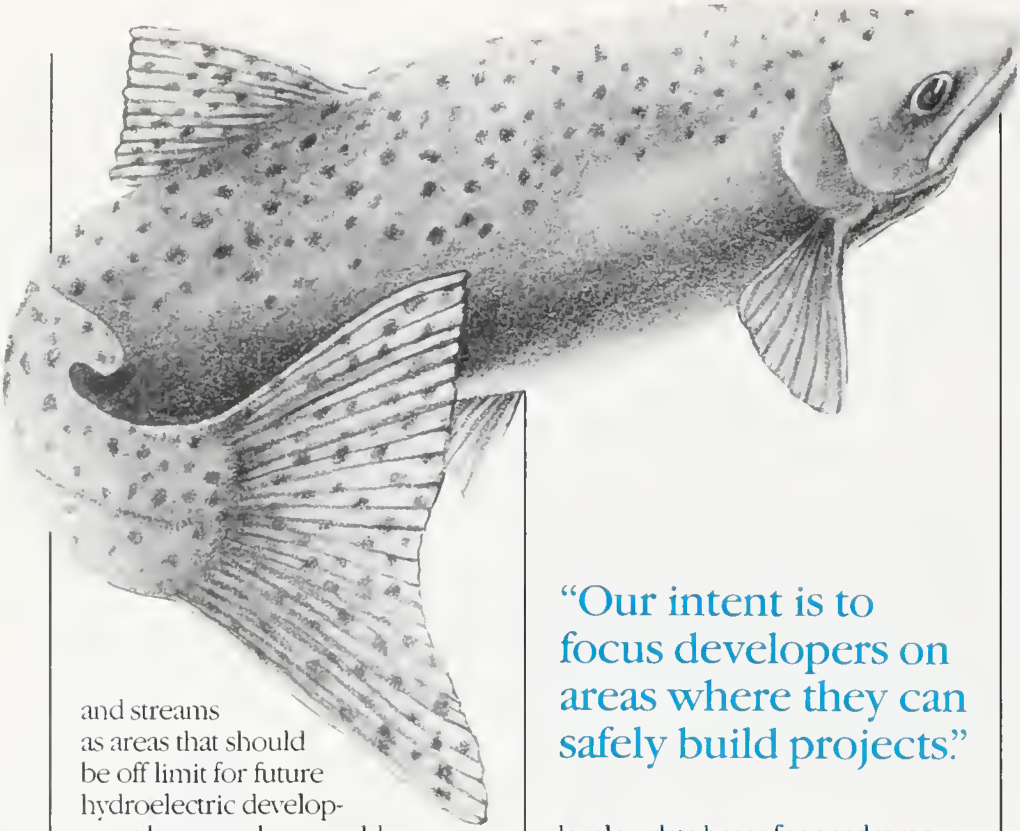
Council moves to protect prime fish and wildlife habitat.

> *"I remember when the great and mighty fish returned to Idaho in abundance. And I am ashamed that my government and industry have waited decades to begin the task of restoring the destroyed fish runs and wildlife habitat. The protected area amendment is an honorable first step toward restoration."*

by Ruth L. Curtis

So counseled Randall Morris, representing his children, at a public hearing in Boise on a sweeping proposal to protect critical fish and wildlife habitat in the Northwest.

On August 10, the Northwest Power Planning Council adopted that protected areas amendment to its Columbia River Basin Fish and Wildlife Program and to its Northwest Power Plan. The amendment is one of the most extensive plans to protect fish and wildlife in the United States. It designates roughly 44,000 miles of Northwest rivers



and streams as areas that should be off limit for future hydroelectric development because dams could irreparably harm fish and wildlife populations that rely on that habitat.

The protected reaches include spawning and rearing areas and migratory routes for fish, plus habitat for important or endangered wildlife.

The proposal was characterized by some parties as a "ban on dams," but the Council's chairman, Morris Brusett of Montana, says the proposal will help developers. "Our intent is to focus developers on areas where they can safely build projects. The areas designated for protection represent only a small portion of the Northwest's streams, less than 20 percent. By knowing where development is possible without serious environmental consequences," he added, "the Northwest will have a far more accurate assessment of what its hydropower potential is, which will help significantly in energy planning."

Six years ago, the Council began the process that resulted in this decision. More than two years were spent gathering data to produce the list of areas to be protected. The information was then used to develop data bases for anadromous (ocean-migrating) fish, resident (non-seagoing) fish, wildlife and the hydropower potential in the region. Material was gathered from several sources by the Council, working with the Bonneville Power Administration, the four Northwest states, the region's Indian tribes and other parties.

"Our intent is to focus developers on areas where they can safely build projects."

At a hearing in Portland, Liz Frenkel of the Sierra Club's Northwest Regional Conservation Committee commented, "I'd like to emphasize the fact — and this is very reassuring to us members of the public in the Northwest — the inventory process rose from the states. We were involved in the process ... This was not an iron corset laid on from high. It came up from the states."

This April, with the preliminary work done, the Council voted to officially begin formal hearings on the proposal. More than a dozen pubic meetings were held throughout the Northwest, and comment was taken through July 8. Over 2,000 individuals and organizations submitted comments, the large majority endorsing the protected areas proposal or calling for even more stringent standards. Commentors raised many issues that were addressed in the Council's final decision.

Resolving the issues

Several issues involved the ultimate scope of the final decision. Should only streams within the Columbia River Basin be designated for protection or streams throughout the entire Northwest including coastal watersheds? Should the stream protection extend to river reaches that have recreational, historic or archaeological significance?

Tim Wapato, representing the Columbia Basin Fish and Wildlife Authority (composed of fish and wildlife agencies and Indian tribes) addressed the first of these concerns. "It is essential that the protected areas extend outside the Columbia River Basin," he argued. "Otherwise, development will be shifted into rivers of the Puget Sound and coastal areas. Important rivers for anadromous fish production, such as the Skagit, Nooksack, Snohomish, Hood Canal and Rogue drainages, will be diminished." On the other hand, Lynn Davison, with the City of Seattle, expressed concern over "whether the Council has the authority to designate protected areas outside of the Columbia Basin."

In the end, the Council decided that areas should be protected both in and out of the basin. The protected areas within the basin were designated under the authority given the Council in the sections of the Northwest Power Act that deal with the fish and wildlife program. The Council designated protected areas outside the basin, but within the Northwest states, under those sections dealing with the power plan.

Several speakers reasoned that streams should also be protected for values beyond just fish and wildlife. Washington Congressman Mike Lowry advised that "other potential criteria should include unique and rare plant communities, archaeological sites, unique geological features, historic sites, scenic values and recreational values. These criteria may be secondary to outstanding fish and wildlife habitat values, yet they are obviously relevant to environmental quality and deserve consideration in the evaluation process."

Kathleen Beamer, with Recreational Equipment Incorporated, suggested that, "by including recreation as a protected area definition, you will be giving more accurate direction to utilities and hydro developers as to where they can invest in development successfully." On the other hand, some commentors wanted a narrower approach. Sherl Chapman of the Idaho Water Users Association urged the Council "to restrict any potential rulemaking to the areas of anadromous fisheries only." The Council decided to consider protecting stream reaches for values other than fish and wildlife if such recommendations are included in comprehensive plans that may be developed by the states and Indian tribes.

As written, the protected areas proposal applied only to new hydropower projects, not to existing dams. But many people pointed out that this needed more clarification. What if a dam owner wants to add hydropower facilities to an existing irrigation or water supply dam? At what stage is a project considered an "existing project?" If it has been approved but not built, is it an existing project?

Al Wright, with the Pacific Northwest Utilities Conference Committee, recommended "some kind of a 'grandfathering' process to make sure that certain projects that have gone through a substantial process and have yet to be licensed ... have adequate provisions of going to completion ... There are some of our membership that have invested considerable amounts of money and have obtained a considerable amount of consensus with the fish and wildlife agencies on adequate mitigation. That level of effort and commitment of resources should have some protection."

Bill Finnegan at Puget Sound Power and Light cautioned, "The Council should clarify the language used so that it is not subject to reinterpretation in the future. The exclusion should apply to hydro projects that add additional generation or capacity or undertake other modification, as well as all existing dams or structures whether or not they currently have generation facilities. This clarification is essential to avoid future attempts to limit the exemption."

On the other hand, Jane Foraker-Thompson, with the Idaho Conservation League, said, "We would like to point out that adding turbines to existing non-power dams or to existing hydropower facilities can result in further severe impact to migratory fish, as well as to the entire watershed and ecosystem. And we would like the Council to include the prohibition of additions of new electric generators to existing dams in the protected areas ... "

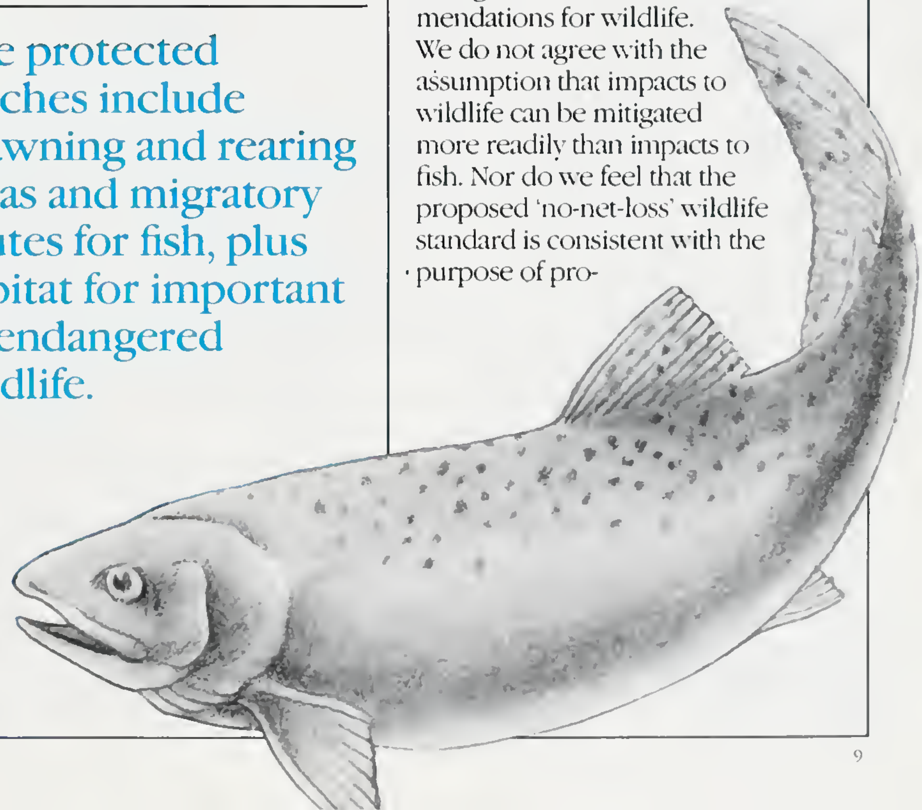
The Council finally decided that the protected areas policy should not apply to existing dams, the relicensing of existing dams, modifications to existing dams, or the addition of hydropower generation facilities to dams that do not currently have hydropower facilities. As to projects not yet built but in the Federal Energy Regulatory Commission's licensing process, the Council recognized that "in many cases the applicant has made substantial investments and has completed, or nearly completed, agreements with all interested parties, including state fish and wildlife agencies. The Council recognizes that the Commission may be obligated to complete its processes on these applications, but expects where possible that the protected areas designations will be taken into account to the fullest extent practicable"

The protected reaches include spawning and rearing areas and migratory routes for fish, plus habitat for important or endangered wildlife.

The Council also adopted a process for reviewing hydropower projects that could provide exceptional benefits for fish or wildlife. (For example, a project that created upstream water storage could improve flows for an entire stream.) Through this process, these exceptional projects could be built in protected areas.

How the proposal would deal with wildlife was also an area of concern. The Council had proposed that, in areas where wildlife or hatchery-reared resident fish are present, no hydropower development should occur that would result in a net loss of such fish and wildlife.

Many people felt, as did the Montana Department of Fish, Wildlife and Parks' Jim Flynn, that, "We do not agree with the Council's recommendations for wildlife. We do not agree with the assumption that impacts to wildlife can be mitigated more readily than impacts to fish. Nor do we feel that the proposed 'no-net-loss' wildlife standard is consistent with the purpose of pro-



tected areas. A no-net-loss standard would not provide clear signals to potential developers or to the Federal Energy Regulatory Commission on the importance of wildlife resources. It leaves the door open to disputes arising from different interpretations of impacts."

The Council agreed that hydropower development also poses substantial risks for wildlife and that dams should not be built on important wildlife habitat. Consequently, the Council abandoned the no-net-loss standard.

In addition, the category of hatchery-reared (e.g., non-wild) resident fish areas was eliminated because the record indicated that these areas contained wild species and were already covered by the protected area designation.

Beyond policy calls, there were technical details in the proposal that needed to be worked through. Several commentors pointed out errors in the lists of streams proposed for protection, and Council staff corrected the lists. But the process for adding or deleting reaches from the list after the proposal was adopted concerned other speakers. The Council had included in the proposal an expedited amendment process for removing areas from the list if they were erroneously included. Many commentors agreed with Larry Murante from Seattle who asked that the Council "use the same expedited review process for additions as well as deletions."

In the final decision, the Council agreed and adopted a process to treat additions and deletions in the same way. Proposed changes will be referred to the appropriate state fish and wildlife agency for review and comment. They will then be considered by the Council on a regular amendment schedule. If a proposal requires faster action, the Council may initiate a special amendment process.

The effects of protected areas designations

The protected areas designation formally amends the Council's Columbia River Basin Fish and Wildlife Program and Northwest Conservation and Electric Power Plan, and it is through these vehicles that its influence will be felt.

While the Council does not license hydroelectric development, the Northwest Power Act requires the Federal Energy Regulatory Commission, which licenses non-federal hydroelectric projects, to take the Council's fish and wildlife program (now including the protected areas designations) into account "to the fullest extent practicable" in its decisions on licensing projects within the Columbia River Basin.

"Boldly make history. It is late, but perhaps not too late; if we act now."

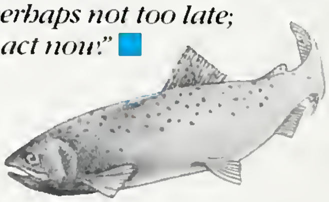
Don Clarke, speaking for the commission, testified that the proposal "will provide significant assistance to the commission in carrying out its comprehensive planning obligations under the current law ... the protected area proposal could significantly affect the commission's licensing decisions." In addition, the Northwest Power Act obligates the Bonneville Power Administration to act in "a manner consistent" with the Council's fish and wildlife measures.

Outside the basin, the protected area's influence will be felt through the Council's power plan. The Federal Energy Regulatory Commission considers the Council's power plan in decisions for projects throughout the Northwest. The designations will also guide Bonneville's resource acquisitions throughout the region. As part of the decision, the Council called for Bonneville to refrain from acquiring hydropower from proposed or new projects in protected areas. The Council found Bonneville's policy of relying on protected areas inside the basin to limit access to its intertie is consistent with the Council's fish and wildlife program and its power plan. (The intertie is the transmission system over which power is moved to California.) The Council also recommended that Bonneville deny access to projects in protected areas located outside the Columbia Basin.

During the public comment period, the Council heard much eloquent testimony about the proposal. One of the most articulate was Brian Goller, an Idaho citizen.

"The Northwest Power Planning Council's protected areas proposal is a first step in developing, as a society, a land ethic. The congressional directive to the Council to protect, mitigate and enhance fish and wildlife has historic implications, in terms of developing that ethic. This is a recognition of the land community, and it gives status to wildlife as constituents of that community. It is an important step in living up to our obligations to the natural environment.

I urge the Council to be broad and inclusive; resist those who advocate narrow interpretations. The Columbia River system is very much an interconnected system. Boldly make history. It is late, but perhaps not too late; if we act now." ■



Dulcy Mahar Interview with

Sharon Nelson

Washington Utilities and Transportation Commission chief discusses power planning priorities.

Illustration by Lynn Carson

Sharon Nelson sits at the helm of the region's largest public utility commission, the Washington Utilities and Transportation Commission or UTC. That she has made her mark is evidenced by the fact that she has recently been elected president of the western region as well as a vice president of the National Association of Regulatory Utility Commissioners.

Washington's electricity and gas companies, telephone companies and the transportation industry all fall under her commission's purview. The commission is charged by the state legislature with the regulation of privately owned utilities to ensure that they provide adequate service at fair and reasonable rates to the public.

The Washington UTC has pioneered "least-cost" planning[1] for the electrical utility industry in the Northwest. The commission now requires such plans from the electrical utilities it regulates: Puget Sound Power and Light, Washington Water Power and Pacific Power and Light, as well as the natural gas utilities. Public Utility commissions in Oregon and Idaho are also looking at the possibility of adopting least-cost planning requirements for the investor-owned utilities they regulate.

Nelson's route to a top utility position started with law school. She later worked for Senator Warren Magnuson on the U.S. Senate Committee on Commerce and was assigned to the consumer and communications subcommittees in the *mid-1970s. "That's where I found out about the changes that were going on in regulation of the communications industry," she says.*

Next, she worked as a consumer advocate for Consumers Union, spending a good deal of her time lobbying Congress. From there, she returned to the Northwest to practice law in a private firm, but found she missed the public policy work. So, when a job opened up with the Washington state legislature, she jumped in. The work was with a joint select committee rewriting the utility code for telecommunications.

She was soon recognized as an expert in telecommunications, and her work came to the attention of Governor Booth Gardner. He appointed her to the state commission where she has been since 1985, serving as chairman during that time.

Nelson holds a bachelor's degree from Carleton College in Minnesota, a master's in teaching from the University of Chicago and a law degree from the University of Washington. She lives in Seattle with her husband and cat.

Q. Washington is the first state in the Northwest to require a least-cost plan from its investor-owned utilities. What do you see as the value of least-cost planning? What will it give you that you didn't have before?

Well, it opens up the process. It gives us some sense that, if a lot of good minds are looking at options available to the utilities, then we can avoid some of the very costly mistakes we've made in the not too distant past. In opening up the process, we're hoping that many points of view can be represented, and public comment on the plans can help the utility refine its planning processes. I think a second, perhaps not intended consequence, but something that's very beneficial for us, is that we're seeing increasing understanding between our staff and the companies' staff. Of course, the ultimate and intended benefit is to have generating and conserving resources brought on line that truly are economically efficient and to avoid unnecessary increases in consumer rates.

Q. How is it going? Where are you in the process?

Puget [Sound Power and Light] submitted its first plan last year, and we're just beginning a similar planning effort with [Washington] Water Power. Pacific Power and Light is a little further behind.

Q. I understand that you asked Puget to expand its plan. Is that correct?

Puget made a presentation, and we sent the company a letter that generally supported the initial effort between Puget and the commission staff. We noted there were several good comments filed by the Northwest Power Planning Council and others that we thought Puget should take into account in its next plan. The companies are required to submit these plans every two years. We're really trying to make it a cooperative effort and not be excessively regulatory. We're not saying, "thou shall do," but we're suggesting what would work. Corey Knutsen, director of strategic planning, and other members of Puget's staff have responded in kind. I think they are all generally agreed that the suggestions we made in our letter are the way to go. The development of Puget's first plan was a learning exercise for both Puget and the commission.

Q. The investor-owned utilities (IOUs) generally say they are not going to buy power from the Bonneville Power Administration. Puget is already deficit in terms of producing its own power, and other utilities may need new resources in the very near future. Yet if these utilities don't plan to turn to Bonneville for resources, where are they going to go?

You are correct that Puget is deficit. It recently concluded a long-term purchase from Water Power. But resource decisions must be made. For Water Power, the sale to Puget has put that utility close to load/resource balance, and if the recent growth in Water Power's loads continue, Water Power will need some new resources soon. Pacific Power's recent load growth has also been at quite robust rates.

Now let's talk about resources. These utilities are looking at their options, and I would be surprised if the lists are much different than those developed for the region by the Council. In the short run, given the regional surplus, there is power available on the spot market at favorable rates. Puget, for example, buys on the spot market daily.

These favorable short-term arrangements will begin to dry up, or at least become increasingly expensive, as the regional surplus diminishes. Thus, now is the time to be looking for least-cost long-term resources. Puget's first least-cost plan talked in general terms about these options. I expect that Puget's next plan will be much more specific. For example, both Puget and Water Power are working on interconnections with Canada, something the Council has been exploring also.

Puget, being deficit, is running its retrofit conservation program at levels close to the recommendations from the regional plan. Water Power scaled back its retrofit conservation effort when it was surplus. Now, in the wake of the Puget sale, I would expect Water Power to once again be gearing up its retrofit conservation program—we will see what its least-cost plan says early in 1989.

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[1] "Least-cost" power planning—planning to provide electrical services at the lowest total cost

Commissioner Dick Casad of the WUTC is also very interested in advancing the "conservation transfer" idea first proposed in the Council's plan. If it can be made to work, this seems like a very good way to demonstrate that conservation is a saleable commodity.

In terms of conservation in the new construction market — the Council's model conseration standards — it will be important that the investor-owned utilities support the standards. This support has to include utility programs and, ultimately, an MCS-based building code for this state.

Q. Does it seem to you that dismissal of Bonneville as a resource provider is at odds with a least-cost plan?

The utilities have not dismissed the Bonneville option. I am aware that key top-level staffers from Puget meet monthly with key top-level staffers from Bonneville. We all know that the IOUs and Bonneville have had, and continue to have, their differences. But I sense that they are trying to develop a new working relationship and this may well lead to future electric transactions.

What Bonneville has to prove is that its power can be priced competitively with other long-term options available to the IOUs. Bonneville can do this by clearly demonstrating that it intends to implement the wise energy policies in the Council's plan, and by figuring out how to make the 7(f) [new resources] rate pool more predictable. If Bonneville can't do these two things, then buying from Bonneville poses considerable risks to an investor-owned utility — risks that have to be figured into any least-cost calculation undertaken by these utilities. Again, I sense that progress is being made on this.

Q. Do you have some thoughts on what the proper role or relationship between Bonneville and the IOUs should be?

The relationship should be a business relationship. Both sides should be operating according to least-cost planning principles, which means that, from time to time, the investor-owned utilities need to bargain with each other as businesses must do.

Yet, as the Council has demonstrated so well, there are many mutual benefits to be gained from thinking on a regional basis. We have to recognize that our Northwest economy is tied quite closely together. Beggar-thy-neighbor policies come back to haunt you. For example. We need

to think regionally and make the conservation transfer idea work—that is how we can keep the total cost of electricity down to this interdependent Northwest economy in which we all participate.

Q. What kinds of structural changes do you see occurring in the utility industry and particularly because of the FERC rulemakings.[2] Do you agree that this is leading toward utility deregulation?

Well, deregulation notions are in the atmosphere right now. Regulators are constantly admonished to emulate the market forces wherever possible. However, in our region, the need is to *not* have cutthroat competition. The need is for cooperation, for planning that is embodied in the concepts underlying the Northwest Power Act.

I have always thought it was somewhat odd because you have this gloss, at least among the private utilities, about all these sort of centrifugal market forces breaking up their systems and requiring different responses to different customers. Then there's the centripetal force of the Act and also the reality of a hydro-based system.

What Bonneville has to prove is that its power can be priced competitively with other long-term options available to utilities.

So, we are faced with a dilemma right now. With the FERC acting in the way it is acting, there are all kinds of reasons for concern about future industry structure and relationships. At this point, FERC seems to be in such disarray that it is difficult to believe they are going to get anything adopted in the time remaining for the current administration.

It is an election year, and FERC seems driven to do something, yet there is no sense of consensus on national policy. In Washington [state], at least, we have been enjoying a hiatus in the tremendously difficult kind of regulatory questions we were facing a couple of years ago. We have used this lull when we don't have to worry about major rate cases to concentrate on least-cost planning. Of course, we recently dealt with the merger.[3] We keep hearing persistent rumors that Water Power or Puget could also be targets for some kind of acquisition strategy by somebody else.

Q. There are those who believe that in the near future the IOUs are all going to merge and there is going to be one huge private utility in the Northwest.

I keep hearing these rumors, and I especially hear them from the Idaho commissioners who think that Water Power, Idaho Power Company and Montana Power could all merge.

Shearson Lehman recently issued a study on merger benefits. Some members of our staff thought the study was very poorly done, and the sources were not well identified. Most of these mergers never seem to come to pass, although in California, Southern California Edison recently announced an intent to acquire another California utility. Perhaps we're just beginning to see the wave. At this point, it remains all speculation.

In terms of our statutes, our lawyers tell us that there is regulatory authority in Washington that is available to the transfer of any assets for the acquisition of these companies. So we feel sure we will not be caught by surprise. If there were something going on; we'd be hearing about it.

Q. Has the UTC commented on the FERC rulemakings? If so, what is the thrust of your comments?

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[2] "FERC rulemakings" refers to three recent proposals put out by the Federal Energy Regulatory Commission to amend its rules. The most controversial of these three proposals would authorize a bidding system for the acquisition of new power by regulated utilities. Under this system, the utility would set criteria for electrical capacity which it forecasts as needed. Interested parties would then be allowed to submit bids for meeting this need. A contract would go to the lowest qualified bidder.

[3] "Merger" is a reference to the proposed merger of Pacific Power and Light and Utah Power and Light Company. The proposal requires the approval of the public utility commissions in the seven states served by the company. All of the state commissions have approved the merger. However, the Federal Energy Regulatory Commission must grant final permission. An administrative law judge at the Commission has ruled against the merger, which now goes before the full Commission.

We have. In general we've said we thought the bidding rule was probably O.K., but that FERC shouldn't make anything mandatory, shouldn't preempt state action. The states have been experimenting in this area and should be essentially left alone to run their experiments. We think bidding has some real merit.

Q. Didn't the UTC investigate bidding as a utility strategy for this state?

We are in the middle of a proceeding. We have collected comments, and most of them are favorable. I have a matrix of the comments by the various parties that has been put together by our staff, and it looks as if we'll probably go forward and issue a Notice of Proposed Rulemaking in this area.

Essentially, our direction would be that we'd have bidding, linked to a least-cost plan in terms of the maximum avoided cost that would be paid in a bid, as well as the quantity of new resources solicited in a bid. How to regulate the so-called "non-price" characteristics still needs to be worked out.

Q. Would your bidding procedure treat conservation as a resource?

We haven't made a decision on that, but I certainly think that it would. That is, of course, one of the main points of least-cost planning, and therefore, it should be integral to the regulatory offshoot of competitive bidding.

Q. There appears to be some concern that regulatory incentives for conservation are really on the disincentive side because once rates are set, utilities won't want to sell conservation if it competes with their ability to get a good rate of return. Doesn't Washington allow a 2-percent rate of return for conservation? Doesn't this expire in 1990?

> We think of the Council as being an intellectual leader, maybe a consultant, of sorts, to us.

We have a law that tells the commission that for a conservation investment by the utilities, we must allow a 2-percent kicker on the return on equity for that investment. The legislature passed it with the explicit intent to make conservation attractive to the utilities.

Q. Has it been successful in encouraging investment in conservation?

There is debate internally on how successful it's been. Some of our staff think it has been a pretty good statute and has primed the pump. Some other people think it has not been all that useful in getting the utilities to really take conservation seriously. But I think our Northwest utilities are far ahead of the rest of the nation. I don't know whether this is a result of the good work done by your folks, or just sort of a "gestalt" and the region has come to favor conservation.

Personally, I think the 2-percent law has been very good; it helped get an infant industry off the ground. I don't know whether it is needed in the '90s or not, given the subsequent development of the resource. To use a real hackneyed phrase, we're trying to make the playing field level so that whatever is most efficient from the customer's point of view is where the utility begins to make its investment. I don't know if we'll continue to support that law when it comes up for review in the legislature. It is a decision we haven't yet made.

Q. Is Washington considering any other regulatory changes to pursue conservation or promote conservation?

We are looking at a few things, some of which I am enthusiastic about, others I am not so sure. You mentioned in your previous question the possible regulatory incentive for utilities to stimulate short-term sales once rates get set in a rate case. Ralph Cavanagh [Natural Resources Defense Council] has suggested a rate mechanism as a way to alter this incentive. I am sure we will be looking at that proposal at least at the staff level.

I am also interested in using one of the main regulatory tools that a commission has—quick regulatory response—to further least-cost planning goals.

For example, suppose a utility spends money on a conservation program—say to support the MCS-based Super Good Cents program. It cannot recover those costs until the next time that it is in for a general rate case. A few years ago, when utilities were in almost every year, this created no particular regulatory barrier to conservation; they could spend the money today and get it back next year. Now, however, I don't expect that we will be seeing the IOUs filing general rate cases all that often. So, if a utility spends money on a long-lived investment such as conservation, it erodes its short-term financial position until it can incorporate the investment in its rates. This problem is compounded if the utility isn't allowed to accrue some kind of a carrying cost on the conservation capital investments. It seems to me that some kind of recovery mechanism is needed as an incentive for resources that are clearly cost-effective and consistent with good least-cost planning principles. I hope that we'll be looking at this soon.

Q. What are your views on the roles of the region's utility commissions as regulators of the IOUs and the Council's role as a planner for Bonneville loads? We are somewhat sister agencies in that we're both appointed by the governors. Are we working closely enough? Has there been productive interaction, and should there be more?

We think of the Council as being an intellectual leader, maybe a consultant, of sorts, to us. Your [computer] modeling and planning efforts are certainly the model for our least-cost planning efforts here. Our staff meets with Council staff and finds that very useful. We try to keep in touch with our own state [Council] members on an informal basis.

I think the communication is really quite good. Of course we could always communicate better, but the relationship seems to be quite cordial and productive at this point.

Q. Are there specific components for your least-cost plans? Do you have guidelines or criteria for them?

Our rule is very general; it is just one page. Other states have gone the opposite direction, promulgating hundred-page rules. Our rule says that there will be a range of demand forecasts; an evaluation of the costs of generating and conserving resources; a consistent cost-effectiveness method to evaluate those resources; and short-term and long-term least-cost plans. It also requires significant public involvement. All of the detail beyond these general requirements are left to staff and the company to develop.

> If a lot of good minds are looking at options available to the utilities, we can avoid some costly mistakes.

Q. Then there is quite a lot of latitude?

There has been quite a lot of flexibility, and that's by design, because we don't want to constitute ourselves as micro-managers of the utility. I have been adamant that I don't want to get into the position where we have changed the relationship between the commission and utility management. Management is still supposed to take the risks, assess the cost/risk benefit and make the decisions. As a regulator, I want to make sure they're making the right decisions, but I don't want to be telling them what to do.

Some of the other states, such as Wisconsin, for example, have gone in the other direction. I haven't wanted to change the regulatory compact such that the commission gets involved at the beginning and essentially works as a second layer of management, okaying these decisions. But, we do have the right to review the prudency of decisions, and I didn't want to change that. We're hoping that, because the process is flexible, because we haven't "straitjacketed" the utilities, along with the fact that we're reviewing the plans every two years, it will keep us close enough together so we won't have the huge investments in plants that then become unnecessary 10 years later. We want the plans' emphasis to be on small, diversified sources of power. That's the direction we all seem to be going.

Q. On a more global level, have you seen or do you see any major new trends in the utility industry?

I really do think that the forces of competition are making themselves apparent everywhere and the demands of the large industrial users, both on the gas and the electric side, are going to be something that we have to deal with in the short term. The broader issues of competition and deregulation will likely be with us in the long term. This particular FERC has introduced the issues rather clumsily. But, they are not going to go away. The cross fuels, the gas versus electric, generate a lot of competition. Now we're getting gas-on-gas competition. There really is substantial competition in the energy area. That is really changing the way we think about how we need to regulate.

It's a pretty exciting time to be in regulation, because you feel that there are sea changes coming, and yet how our institutions and our laws will respond remains to be seen. You feel you have a chance to try to sort out some of these problems and influence public policy outcomes. But we're just at the beginning of the process.

Plight of the Homeless

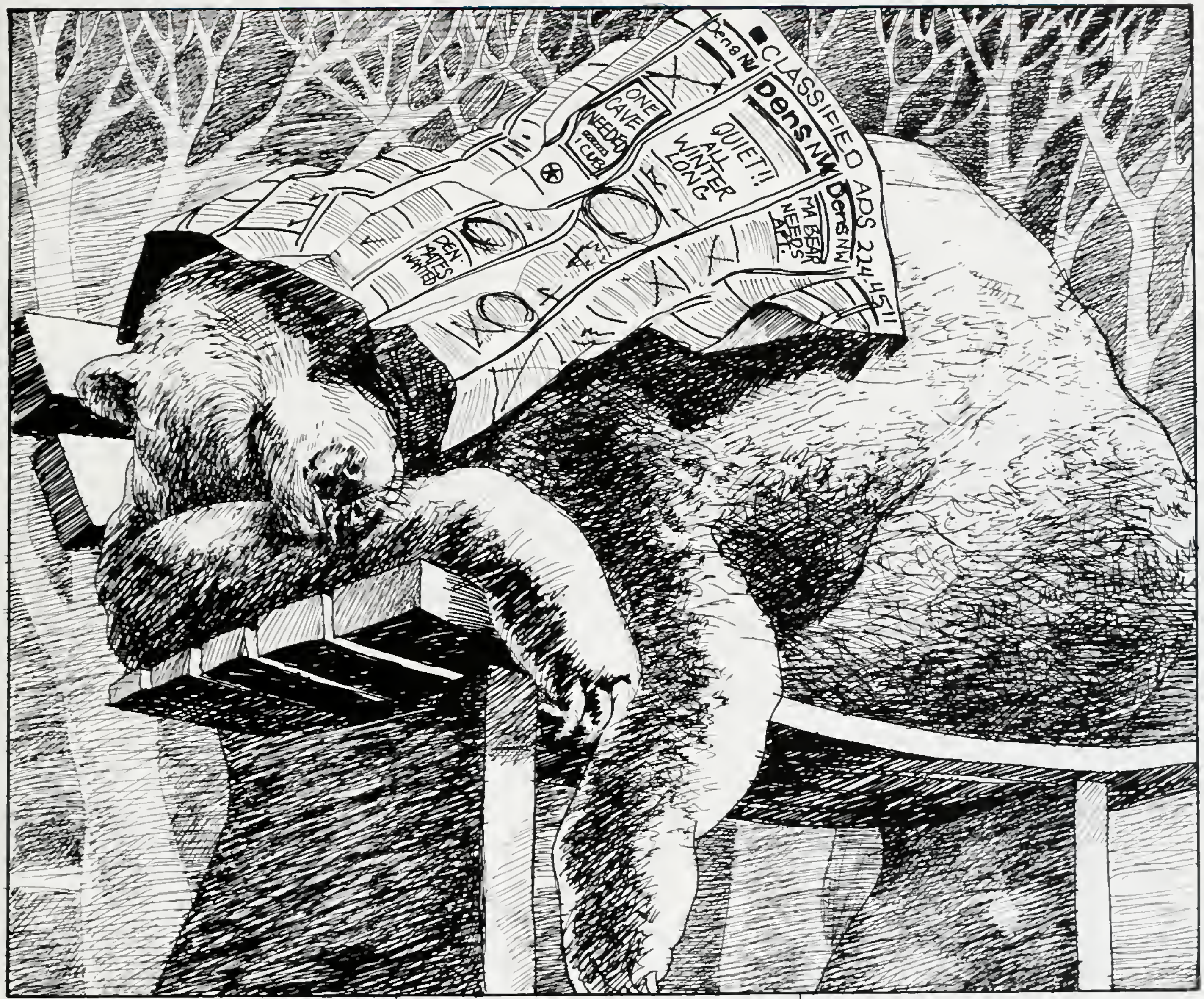


Illustration by Fredericka Spillman

by Beth Heinrich

It doesn't take a professional biologist to figure out that what needs dry land to survive, does not fare well under 80 feet of water. So when water pools up behind dams, the host of animals that once made their homes in the green river bottoms and adjacent uplands are flooded out.

Shrinking wildlife habitat: the region's next environmental challenge

?

It is easy to assume that these animals simply moved on up the hill or across the desert. But the land can sustain just so many animals. That maximum number is referred to as a habitat's carrying capacity. If too many bears or beavers try to live in the same area, one of many side effects is the possibility they may literally eat themselves out of house and home. Much like tenants that get kicked out of buildings with no vacant apartments, wildlife pushed out of one area because of inundation usually have nowhere else to go. Eventually those wildlife populations die off, and their values to society are lost.

Along those same lines, a particular mammal or bird relies on specific vegetation to supply it with the essentials to live—food, water, cover and habitat to bear and raise its young. This makes up its ecosystem. The yellow warbler, bald eagle, or muskrat, which are associated with willow thickets and cottonwoods along river banks, can't survive in the dry sagebrush lands that now make up many reservoir shorelines. But, fluctuating water levels or steep terrain also make it difficult for that waterside or riparian community to establish itself along the new shoreline. The original wildlife ecosystem is lost forever, and biologists must resort to improving other lands to enhance other wildlife populations to make up for the losses.

This reclaiming of habitat to replace flooded ecosystems is a major focus of proposals to mitigate wildlife losses at Grand Coulee Dam in Washington, eight dams in the Willamette Basin in Oregon, and the Palisades, Anderson Ranch and Black Canyon dams in Idaho. The Northwest Power Planning Council is reviewing these proposals as it explores the policy implications of adding substantial new expenditures to the Columbia River Basin Fish and Wildlife Program. Only two other wildlife mitigation plans, those for Hungry Horse and Libby dams in Montana, have come before the Council and been adopted into the program. With the new proposals, and at least eight more to come, the Council is seeking answers to some major questions.

Who's Hit the Hardest?

Thousands of acres of wildlife habitat in the Columbia River Basin, now inundated by vast reservoirs, have been lost forever. Usually the first to go is the lush streamside greenery, or riparian areas, that is home to countless birds and mammals. These rich riparian areas are probably the most productive of all wildlife habitat, providing an unsurpassed supply of food, protection, denning and nesting sites. Also lost are the cottonwoods and other trees that often line the river banks, supplying perches and nesting sites for bald eagles and other birds. Because of steep terrain or fluctuating water levels in many of the reservoirs, these riparian areas can't be re-established along the new shorelines.

Just up from the streambanks are sagebrush and grasslands, as well as pines and firs, that are often inundated. These areas provide critical winter feed for big-game herds such as deer and elk. During the harsh winter months, the deep mountain high snows force the herds to these lower elevations where they can more easily paw through the snow for food. Without accessible and abundant food, many big-game animals perish during the winter. These lower elevations also provide important upland-game habitat. Some of the game birds, such as grouse and quail, do not migrate south for the winter, and thus rely on this habitat to supply the essentials year round.

When devising wildlife proposals for particular hydropower projects, wildlife managers use old aerial photographs, private snapshots, conversations with old-timers, past game records and anything else they can find, to mentally reconstruct the site before the dam was built. By comparing that with what the site looks like today, managers can make an estimate of how much habitat was lost and how many animals it might have supported. It would be impossible to propose a mitigation or enhancement project for every species that was affected. So instead, managers choose key species, or "target" species, to plan mitigation projects for, knowing that a number of other wildlife species that share the habitat will also reap the benefits.

Here is a sampling of wildlife species frequently affected by hydropower development.

Uplands

Big game
deer
elk
mountain sheep
bear
moose

Nongame
sparrows
meadowlarks
ground squirrels
pocket gophers
mice

Upland game
ruffed grouse
sage grouse
blue grouse
sharp-tailed grouse
California quail
jackrabbits
cottontail rabbits

Riparian Areas

Aquatic furbearers
beavers
muskrats
river otters
mink

Predators
black and grizzly bears
bobcats
foxes
coyotes

Waterfowl
geese
ducks
swans

Nongame birds
bald eagles
hawks
owls
blackbirds
herons
kingfishers
warblers
swallows
sandpipers
woodpeckers

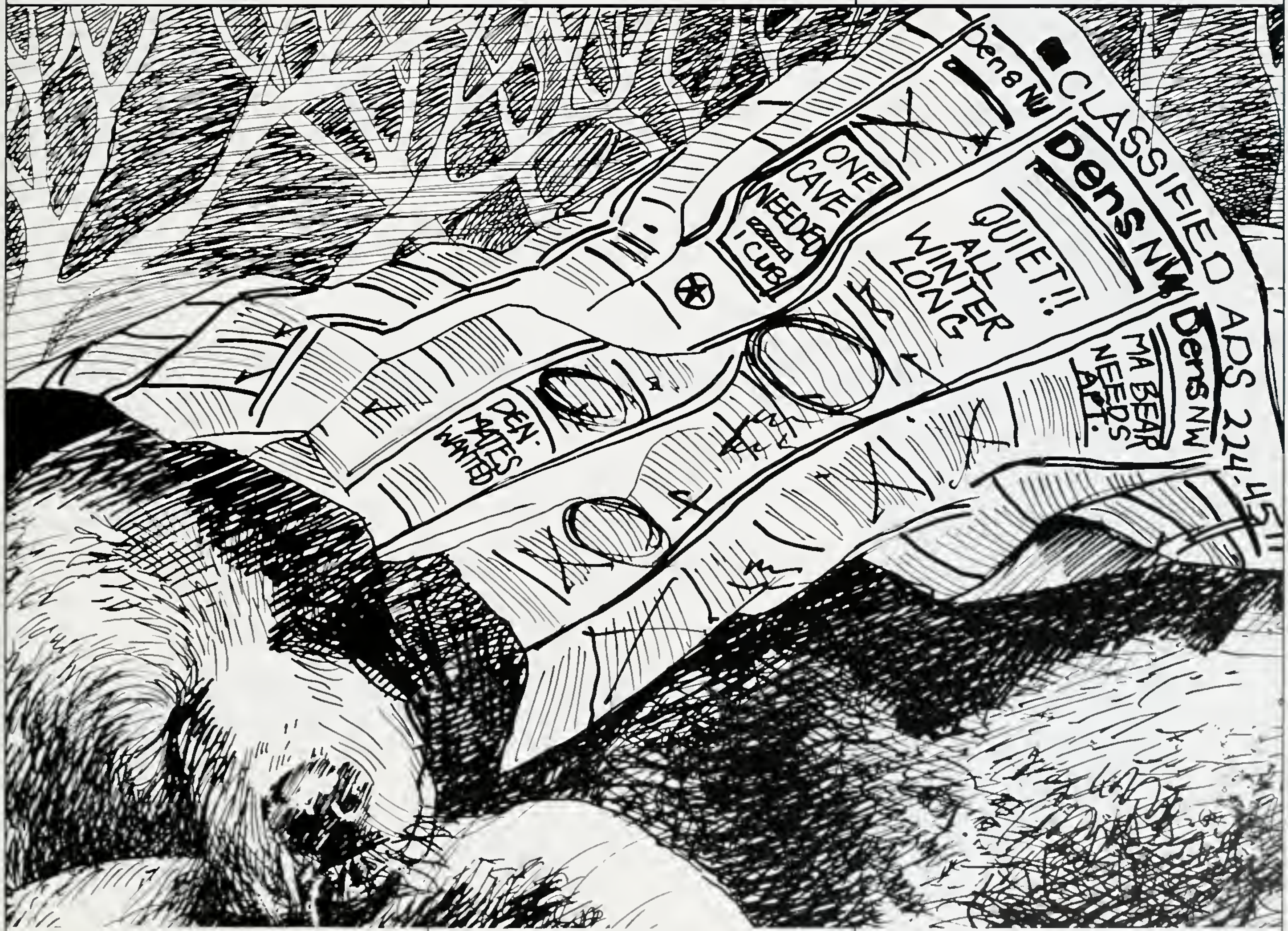
Divvying up the damage

No one can deny that hydropower facilities have taken their toll on many wildlife species. But one of the questions the Council must face is just how much of the damage is directly related to the production of hydroelectricity. Under the Northwest Power Act, the source of the Council's authority, only hydropower-related damages are to be addressed by the fish and wildlife program. But Palisades and Grand Coulee dams, for example, are just two of several multipurpose dams in the federal system. They not only generate electricity, they also provide water for irrigation and storage for flood control.

Some utility representatives have argued that the costs of wildlife mitigation should be shared among the project purposes, arguing that hydropower does not receive 100 percent of the benefits, and thus shouldn't have to bear 100 percent of the costs.

But many wildlife professionals think differently. They propose that all of the damages to wildlife are attributed to hydropower and that ratepayers should pay the entire mitigation cost. They also contend that most of the federal hydro projects received authorization from Congress largely because power production could provide sufficient revenues to repay the federal treasury's investment. Without hydropower, they maintain, these projects would not have been financially feasible.

One way or another, the dams made it from the desks of Congress to the Columbia River drainage, and someone, somewhere, is going to have to determine how much wildlife mitigation the hydroelectric system is responsible for. Back in 1986, when the Council wrestled with this issue over the wildlife mitigation plans for Montana's Hungry Horse and Libby dams, it chose what is known as the "congressional repayment schedule." In other words, the Council determined that ratepayers should be held accountable for approximately 77 percent of the mitigation costs, the percent of project costs returnable to the federal government from power revenues. The congressional repayment schedule is only one of several



ways to allocate mitigation costs, however, and the Council made it clear it intended to set no precedent back in 1986.

Pulling on the purse strings

Another question arises over the costs of wildlife reparations and the limits, if any, on those expenditures. According to the Bonneville Power Administration's wildlife program manager, Jim Meyer, Bonneville's planned expenditures for wildlife will reach $5 million in Fiscal Year 1990. However, the proposals before the Council could add up to $10 million per year if funded over the next 10 years, and there are at least eight additional mitigation proposals still to come.

How will the region afford these new projects? Some of the options include slower-paced wildlife funding, an increased Bonneville budget or reallocation of existing fish and wildlife funds. Also on the table is the idea of placing a cap on wildlife mitigation expenditures, either on a hydropower project-by-project basis or for the entire wildlife mitigation program.

The budget question also brings up one of scheduling. If funds are indeed the limiting factor, should pending wildlife mitigation projects throughout the basin be prioritized and spaced out over a number of years? Should the proposals now before the Council be put on hold until managers complete the remaining mitigation plans in the Columbia Basin, giving the region a better idea of what's to come in the way of wildlife proposals?

Adding acre for acre

One of the reasons the Council and utilities are faced with higher wildlife mitigation costs than they expected, is the intent of the plans' developers — wildlife agencies and Indian tribes — to acquire new land to replace habitat now sitting at the bottom of reservoirs, rather than rely on more piecemeal approaches.

All of the mitigation proposals before the Council are based on this habitat approach. Wildlife losses are described in terms of quantity and quality of habitat inundated. Those lost acres are then replaced with new lands, though it is not easy to duplicate the original habitat that indigenous wildlife need to survive. Nonetheless, the issue of enhancing adjacent public land, securing conservation easements, or outright purchasing of new land raises the question whether the Council's wildlife program goal is to replace lost habitat, acre for acre. If the Council decides that it is, a second question must be answered; once land is purchased, who will maintain ownership and who will pay its annual upkeep?

Backseat backlash

Probably the most pressing question facing the Council is not one of how best to quantify wildlife losses, enhance elk habitat, or even determine who pays for what. A more pressing question may be how important is the wildlife program in relation to rebuilding the salmon and steelhead runs or other priorities in the program?

The wildlife agencies and tribes are quick to point out that the Northwest Power Act clearly states that wildlife populations, as well as fish, are to be protected, mitigated and enhanced to the extent affected by hydroelectricity in the Columbia River Basin. Some also rush to reason that wildlife have taken a backseat to salmon and steelhead in the fish and wildlife program, a precarious position neither appreciated nor warranted, they insist.

Determining the relative importance of wildlife in the grand scheme of things also brings up whether it might not be appropriate to set basinwide mitigation goals and objectives for wildlife, similar to setting a basinside goal to double the salmon and steelhead run.

Whatever approach the Council takes, it is time to reevaluate the role of wildlife mitigation and the part it plays in the fish and wildlife program. The review begins this fall, with an issue paper that combines the current proposals and spells out the key policy questions to be resolved. The Council will hear comment on the paper before moving on to specific wildlife projects. ■

Four Steps to Future Wildlife

The Northwest Power Planning Council's Columbia River Basin Fish and Wildlife Program contains a section devoted strictly to addressing the damages done to wildlife populations by hydroelectric development in the basin. By far the most harm inflicted on the animals is the direct result of inundating acres upon acres of wildlife habitat. To effectively and systematically alleviate those losses, the Council has established a four-step process that state and federal wildlife managers, Indian tribes and project operators are to complete for each hydroelectric project in the Columbia Basin. The Bonneville Power Administration is funding the wildlife planning process. The first three steps of the process for all of the federal hydroelectric projects are nearing completion.

4

Program Amendments.
The fourth and final step calls for the Council to amend the mitigation plans into its fish and wildlife program. Before doing so, the plans are put through a rigorous public review process, which may result in some revisions. Once the Council amends a mitigation plan into the fish and wildlife program, then Bonneville or the appropriate project operator can begin funding the implementation of that plan.

3

Wildlife Mitigation Plans.
Step 3 is the wildlife professionals' chance to devise a plan for each hydropower facility to address the wildlife losses identified in the loss statements. Once the managers have completed the mitigation plans, they forward them to the Council for review and amendment into the Council's Columbia River Basin Fish and Wildlife Program. The mitigation proposals for Grand Coulee Dam, the Willamette Basin facilities, Palisades, Anderson Ranch and Black Canyon dams have reached this stage in the planning process. Bonneville expects that the wildlife mitigation plans for all of the federal projects will be completed in 1990.

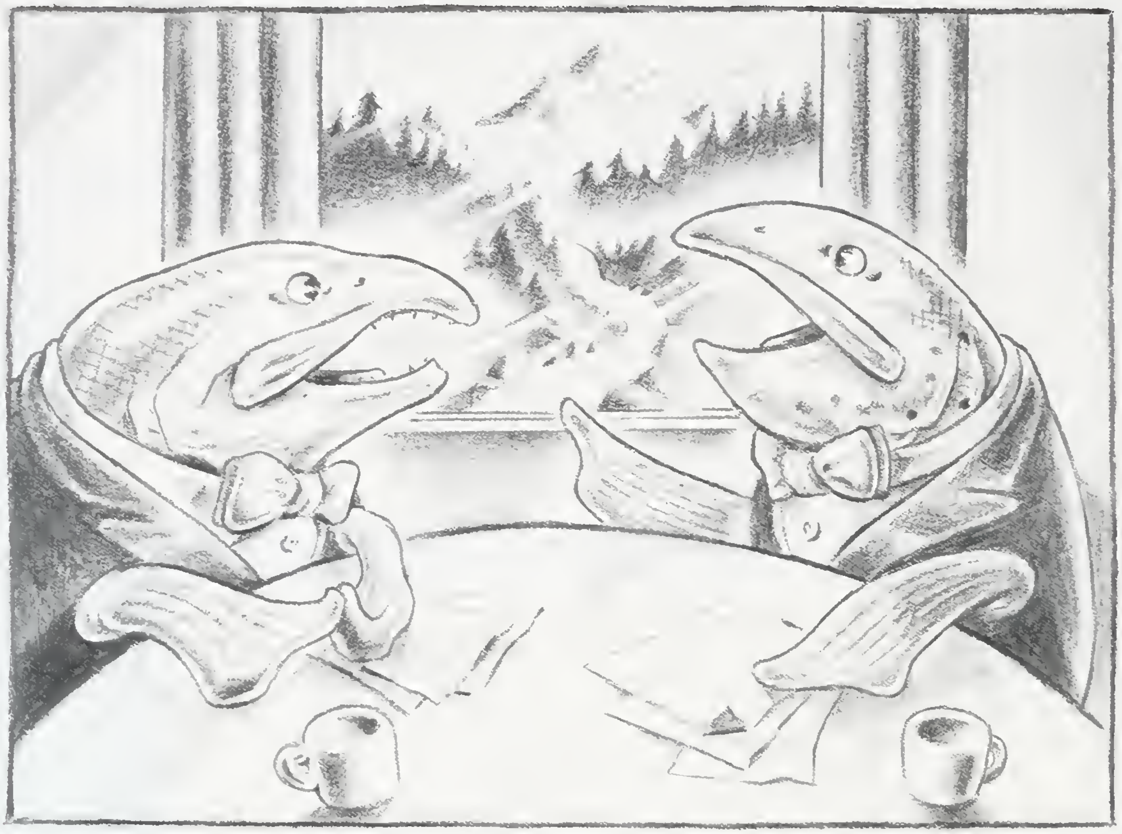
2

Wildlife Loss Statements.
Step 2 calls for wildlife loss statements that quantify the amount of wildlife habitat or the number of animals that were lost due to the hydropower projects. Wildlife managers are instructed to take into account any benefits to wildlife that may have resulted from the projects, such as resting habitat for waterfowl that a new reservoir may have produced. The net loss statements for all of the federal projects are scheduled to be completed in Fiscal Year 1989.

1

Mitigation Status Reports.
The first step in the process entails a thorough review and analysis of past, present and proposed wildlife mitigation programs at each of the hydroelectric facilities in the basin. The status reports, now complete for the federal projects, documented the need to pursue more wildlife planning at the facilities.

STRAIGHT TALK AT THE



ROUND TABLE

Frank appraisals of five years' focus on fish.

It was intended as a two-day retreat into the foothills of Oregon's Mount Hood for frank appraisals of the first five years of the Columbia River Basin Fish and Wildlife Program. Northwest Power Planning Council Member Bob Saxvik of Idaho, chairman of the Council's fish and wildlife committee, opened the event with a challenge: "The Congress and the people of this region expect nothing less than that we protect and rebuild salmon and steelhead populations almost lost in this basin because of the construction and operation of our undeniably valuable hydroelectric system."

Saxvik called out an abbreviated list of major fish and wildlife program accomplishments and shared the Council's appreciation for the efforts of "fisheries agencies, the tribes, the Bonneville Power Administration, the U.S. Army Corps of Engineers, the Bureau of Reclamation, the Federal Energy Regulatory Commission, the land and water managers, public and private utilities, independent fishing groups and the individual citizens of the Northwest."

"You have backed up your opinions with actions," he added.

At the round table were the leaders of each of those entities, brought to the same table for the first time. They came prepared to tackle the three questions around which the two-day session was organized:

1. In what areas has the salmon and steelhead program been successful and beneficial?
2. Where has the program fallen short?
3. How shall we take on the remaining challenges?

Day one, June 29, was billed as the time for speakers at the table to offer their views on the program. Each listed his or her favorite accomplishments, identified common ground and reflected on the needs of the future.

Policy-makers were joined the

Illustration by Reed Darmon

second day by invited national experts representing specific fields of fisheries knowledge. They made presentations on the future of natural salmon and steelhead production, the economic benefits of increasing salmon and steelhead in the Northwest, and ways the region can negotiate new agreements to move the program forward.

Particular themes emerged early and were echoed throughout the two-day dialogue:

1. Cooperative ways need to be found to continue the successes of the first five years.
2. Safe passage must be provided for juvenile salmon and steelhead passing Columbia and Snake river dams.
3. Research on salmon and steelhead must be coordinated and information systems shared.
4. Fish production should balance hatchery breeding with protection for wild fish.
5. The management of salmon and steelhead harvests should be continually improved.
6. Water supply and water conservation should both be addressed.
7. Estimates of program benefits should be refined to include recreational, commercial, tribal and economic development values of salmon and steelhead.

Revisiting an old debate

The exchange on issues was far more candid than "canned," heating up quickly over old disputes. First to speak was Tim Wapato, executive director of the Columbia River Inter-Tribal Fish Commission and chairman of both the Columbia Basin Fish and Wildlife Authority (the umbrella group of state and federal fish and wildlife agencies and Indian tribes in the basin) and the Pacific Salmon Commission, which oversees implementation of the United States/Canada Pacific Salmon Treaty.

We continue to have a problem that has plagued this system since the first dams ... and that's safe passage [around dams] for downstream [juvenile salmon and steelhead] migrants ... Despite repeated attempts by many parties to convince the Corps of Engineers to spill minimal amounts in order to attain the 90-percent [smolt] survival standard within the program, the Corps continues to operate according to its own rules ...

If all agencies, particularly those who control the levers on the dams, are not involved and bound by items and specific proposals within the program, then we need to take whatever steps are necessary to see that that occurs.

General Mark Sisinyak of the Corps' North Pacific Division delivered the Corps' response.

Our current plan is to mitigate juvenile fish passage mortality caused by Corps' projects to the extent "incrementally justified." We feel that only by analyzing each element of an overall plan having to do with the fisheries ... on an incremental basis, by comparing costs and benefits, can we assure that the measures represent a wise federal investment ... The spill for fish is not, in our view, adequately justified.

There was more verbal skirmishing, which featured the General's description of three ways the Corps' fish and wildlife efforts could be funded: through traditional appropriations to the Corps; through regional interests such as Bonneville; and through specific direction of Congress. That part of the discussion led Washington Council Member R. Ted Bottiger to ask a pointed question.

All of the expertise available to me tells me that [spills for fish are] essential, so obviously, your experts and my experts disagree. If I pay for it myself, can I just tell you what to do?

And the General fired a simple answer.

If you have some money, and you want some federal design and construction done, I'm confident the Corps of Engineers can do that.

"I know of no other set of complex societal or resource problems that are being handled as well as you are handling the salmon and steelhead issues."

Break for inspiration

Despite the early debate, Charles Wilkinson, University of Colorado law professor and author of numerous books on natural resource law, delivered a luncheon address that provided both focus and inspiration for the rest of the colloquy.

What we're dealing with is a part of the world where natural resources affect society uniquely, where there is a tie between landscape and animals and rivers and mountains and plains and forests and weather and people, that is deeper and more direct than in any reasonably well-populated area in the world. So all of us who are going to do our jobs right can't just think in terms of resources ... We have to think in terms of the whole society; of jobs, family, religions, avocations, beauty, art, all of the things that make up community, all of the things that combine to make up the human spirit.

... I know of no other set of complex societal or resource problems in this region that are being handled nearly as well as you are handling the salmon and steelhead issues here ...

You have, over the last decade, moved toward an ethic of place by respecting the other side of the equation, the fish and the many people who depend on them ... you have done this better than any other single place in the country. I hope you find ways to con-

tinue to inculcate in the consciousness of the people of this region how wondrous are these animals and their habitat, about how they are a central thread that binds together the Pacific Northwest, about how they cannot be replaced.

... You are trustees, in the most basic sense, not just for natural resources, but also for the whole society in the Pacific Northwest ... You have fulfilled that trusteeship role ... in an absolutely inspiring and historic way ... and all of us who love the Pacific Northwest and its unique, magnificent qualities, wish you well as you set your sights even higher in the decades to come.

Cuts from the conversation

Even a summary of all the issues discussed at the round table, if it included quotes from the participants, would take up more than an entire issue of this publication. The transcript is two-volumes long, each book totaling more than 200 pages. Consequently, what follows is more of a sampling than a summary. The selected comments are drawn largely from the first day, when policy leaders presented their reviews of the first five years' salmon and steelhead recovery effort. A more complete summary will be released for public review this fall.

■ General Mark J. Sisinyak, North Pacific Division, U.S. Army Corps of Engineers:

To put the Corps' effort in perspective ... we have, through 1987, invested over $400 million ... in fish facilities. This represents some 13 percent of the federal dollars spent on Corps projects. Of the amount I just talked about, $90 million has been spent on juvenile fish protection.

... [on] the question, "Do you think the program is working?" My answer is yes, it is working. The Corps of Engineers ... has implemented most of the measures that the Council has put together with all of your help. And we will continue to comply with the provisions of the Power Act and respond to the Council's fish and wildlife program ...

We will implement those measures we are authorized to implement and which meet the requirements of our lawyers' regulations and policies applicable to the Corps. Obviously, the Corps is obligated to comply with the Power Act. I submit to you, there are several other laws that the Corps of Engineers must continue to adhere to also.

■ Ed Sienkiewicz, Jr., senior assistant administrator, Bonneville Power Administration:

I hope you will bear with me when I say "we," I mean all of us. I don't mean the Bonneville Power Administration ... We are just one of the players.

... there have been successes in terms of improving habitat that will be beneficial to the perpetuation of wild stocks ...

... We have completed one hatchery at Cabinet Gorge. We broke ground just a week or more ago at Colville. We are working rapidly for the hatcheries of the Yakima and Umatilla ...

... We have been successful in ... dealing with fish disease and in understanding the influence of predators on survival of those fish.

... By way of perspective, in 1980, Bonneville's direct expenditures for fish and wildlife were $1.9 million. By 1988, it was nearly 20 times that amount and projected to go up even more.

■ Al Wright, executive director, Pacific Northwest Utilities Conference Committee:

I think the Council's articulation of its goal of doubling the [salmon and steelhead] run size has put some material quantification on what it is we're trying to do, and I think that has been productive. I hope it also has dispelled a lot of the divisive arguments that went on early in the program formation about ... the hydropower obligation, about cumulative debts and obligations to totally restore the fish run to ... pre-white man involvement in the Columbia River.

■ Joseph Blum, director, Washington Department of Fisheries:

The progress we have made in the last five years is that we can have the forum today and have this kind of exchange. That's not been possible in the past. It has happened because there is a spirit in the Northwest that is willing to arrive at consensus on very difficult issues.

I will give us a challenge of leveling the table, of building that consensus and getting on to where we are not dealing with micro-management, but we are dealing in the management of the big issues that we are capable of handling.

■ Ken Pedde, deputy regional director, Bureau of Reclamation:

In 1951, the Bureau of Reclamation began studying ways to improve the water supply in the Yakima Basin. An integral part of that study ... was fish ladders and screens. At that time we weren't able to get the necessary support, the necessary consensus, to go forward with the project.

The Council's focus of attention on the need for passage facilities has helped us accomplish something we have been looking at for a long time ... in that area, the Council's work has been extremely successful.

Rolland Schmitten, Northwest regional director, National Marine Fisheries Service:

If I was to offer a grade for all of us for the first five years of progress, I would say that it would be a "C" grade or an average grade ... and frankly, only because of the last two years of effort.

Looking back now, it is my opinion that what we did to ourselves was to develop such a high degree of caution that we made it very difficult to get the program off the ground and running ... I would like to see more results and less studies.

Paul Vetterick, associate state director, Bureau of Land Management:

Our major role in wildlife and fisheries activity is that of a habitat manager, and ... with the Columbia Basin there is about 5,000 miles of cold water fish habitat under Bureau of Land Management administration.

We heard earlier about federal expenditures. Our experience ... for anadromous fisheries in western Oregon easily shows a cost-to-benefit ratio of 1-to-3. For every dollar we spend, we can very, very safely assure at least $2.50 or $3 return on fisheries stock ... some projects go as high as 1-to-7 [cost-to-benefit ratio].

Elmer Schuster, Yakima Indian Nation Tribal Council:

... communication has improved ... I hope the period of litigation is over. If we forget what litigation was like ... ask some of the old players that were a part of that litigation process and I think they could remind us of how awful it was.

I have heard the term "consensus" today. Through consensus ... the efforts of the Power Council and the utilities, all the players involved, the states, the tribes, through our efforts, Yakima is going to be the model.

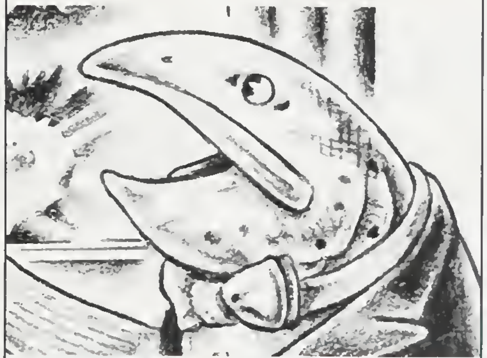
Jerry Pavletich, regional director, Trout Unlimited:

Here in the Northwest, we have reminders everywhere — "Salmon Creeks" without salmon; places called "Fish Trap," and no one can recall why they were given that name; "Redfish Lake," and children ask where are the fish that turn red.

In our view, public awareness is one area where we believe the Council has been tremendously successful. Salmon and steelhead are in the news a great deal ... because of the efforts of the Council.

Bill Bakke, executive director, Oregon Trout:

It's a question of how we restore and sustain fish populations in a fragmented political environment, with short-term goals and expectations and very poor ecological data ... the Council ... opened the door for the public to have some role to play in the decision process ... this was not really possible before because it was such a broad-based problem.



Two final challenges

Bill Wilkerson, former director of the Washington Department of Fisheries and current director of that state's Department of Revenue, urged round-table participants to:

Put people in charge of change who have common sense. But also put people in charge who are the "change agents" — the people who can deliver change. Five years from now, if you ... deliver people with common sense to the role of leadership and people who are ... willing to take the heat for it, you will see more change on the Columbia River.

Kai Lee, former Washington member of the Northwest Power Planning Council and University of Washington professor, provided the gathered leaders a view of the Columbia Basin from outside the United States. Lee had just returned from delivering a paper on the Columbia River Basin Fish and Wildlife Program at the International Institute for Applied Systems Analysis conference in Laxenburg, Austria. He explained that the fish and wildlife program is an example of a concept called "sustainable development."

This is the hope that it will be possible to carry out economic development in such a way that we can husband our natural resources and environmental quality on a global basis throughout the world and particularly for the poor countries of the tropical part of the globe.

I came back from Europe having talked with people from the Nile, people from the Danube, people from the other great river basins of the world, and I came back convinced that there is only one place in the world where sustainable development has a fighting chance today, because the problem with sustainable development is that it raises a host of very difficult, in some places cruel, trade-offs. Trade-offs very much like the ones we're trying to deal with here in power and fish but where the stakes are agriculture, human survival, and whether poor nations will have a chance to have a 21st and 22nd century.

The Columbia River Basin is a leader in the world ... This is the only place where we are tackling seriously ... the challenge of sustainable development.

We have a world class opportunity here, an opportunity to teach the world some important things about what mere human beings can do with natural forces. But we will have that opportunity only if all of you who are left here don't blow it.

SHORTS

Legislation aimed at slowing global warming by encouraging conservation and renewable resources has been introduced before the U.S. Senate by a bi-partisan group led by Colorado Senator Tim Wirth. The "National Energy Policy Act of 1988" calls for reducing carbon dioxide emissions in the United States by 20 percent by the year 2000. Energy conservation in buildings and the use of alternative transportation fuels are both called for in the proposed legislation. The chair of the Senate energy committee, J. Bennett Johnston, is a co-sponsor of the bill. Montana senators Max Baucus and John Melcher and Washington's Dan Evans were among the western supporters of the bill. (Source: *Western Energy Update,* 6500 Stapleton Plaza, 3333 Quebec Street, Denver, Colorado 80207.)

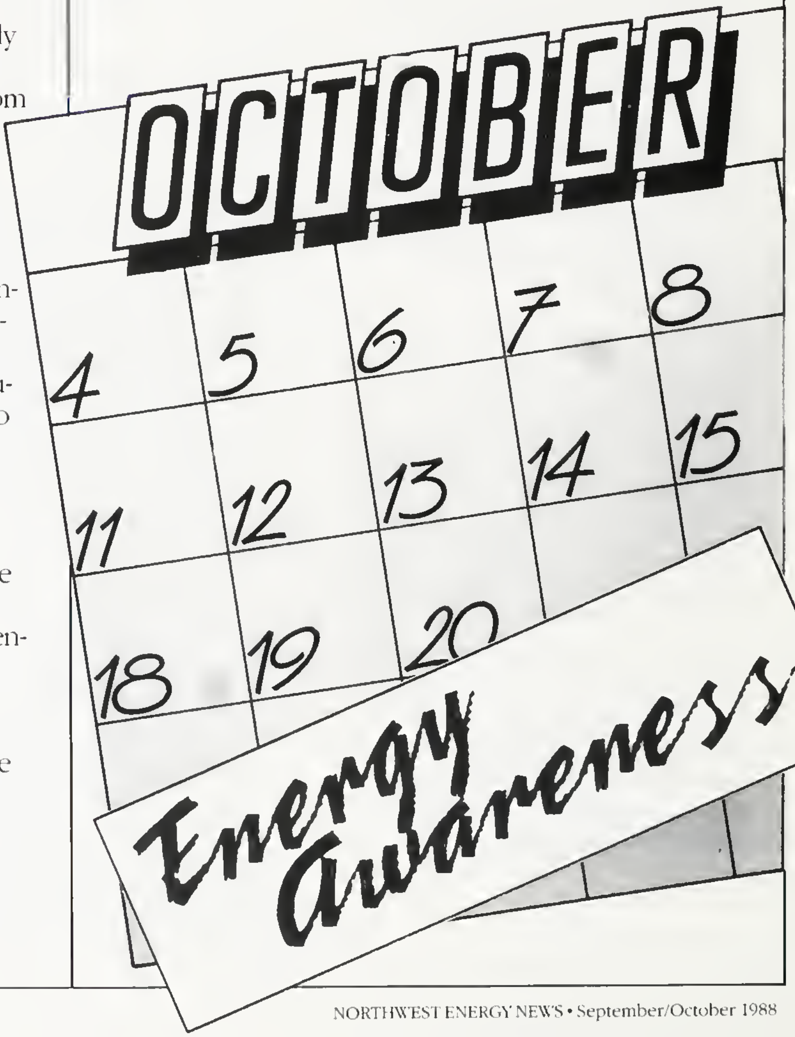
Alaskan salmon harvests accounted for more than 15 percent of the dollar value of the entire fish and shellfish catch in the United States last year—$473 million—with most of the labor and capital coming from Washington and Oregon. That catch is expected to jump 42 percent in 1988—from 95-million to 135-million salmon. Furthermore, the total annual worldwide production of "farmed salmon" equals only about 10 percent of Alaska's annual harvest. (Source: *Marple's Business Newsletter;* 911 Western Avenue, Room 509, Seattle, Washington 98104, 206-622-0155.)

A global energy war is coming this fall: watch for it. Segments of the "war" will likely be broadcast nationally. The events' planners, the American Energy Assurance Council, a coalition of business, government, consumer, environmental and academic officials, are hoping it will focus public attention back on conservation and a national energy policy. The "war" itself will simulate the nation's and the world's condition 30 days into a crisis caused by oil embargoes and other energy shortages. (Source: *Rocky Mountain News,* Denver, Colorado.)

October is National Energy Awareness Month and the theme for 1988 is "Energy Makes America Work." The U.S. Department of Energy, other state and federal agencies and numerous non-governmental organizations are participating in educational events designed to increase American awareness of the role of energy in the U.S. economy and its importance to health, welfare and national security. (Source: *Energygram,* Oregon State University, Extension Service, Corvallis, Oregon 97331.)

Tomorrow's clothes will respond to changing weather if they are made of a U.S. Department of Agriculture patented fabric called "polytherm." Clothing made of this fiber will "sense" temperature changes and release stored heat or feel cool depending on the climate. The new textile uses a polymer to bond a substance similar to antifreeze (polyethylene glycol) to wool, cotton or fabric blends. It may appear in clothing, footwear, insulated draperies and even building insulation. (Source: *Energygram,* Oregon State University, Extension Service, Corvallis, Oregon 97331.)

Electricity consumers in Kuwait use roughly 12 times the energy Americans use, most of it for air conditioning. And in Italy, ratepayers contract for the power they need. If they go over the contracted amount, the power is cut off. In Russia, utility bills are blank forms to be filled in by the consumer who reads the meter, then pays in person and in cash at the appropriate agency. (Source: *The Centinal,* The Columbia Group, 2121 First Avenue, Suite 103, Seattle, Washington 98121.)



CALENDAR

September 27-29 — "Northwest Energy Connections '88," at the Sea Tac Red Lion in Seattle, Washington. Sponsored by Puget Power in cooperation with Seattle City Light, Snohomish County Public Utility District, Tacoma City Light and the Bonneville Power Administration. For more information: TLA Marketing Services, 10020A Main Street, MS443, Bellevue, Washington 98004, 206-455-9917.

October 1 — "Sustainable Energy: From Possibility to Reality," a regional energy conference at the Greenwood Inn in Beaverton, Oregon. Sponsored by the Solar Energy Association of Oregon. For more information: Solar Energy Association of Oregon, 2637 S.W. Water Avenue, Portland, Oregon 97201, 503-224-7867.

October 12-13 — Northwest Power Planning Council meeting in Missoula, Montana.

November 8-9 — "Energy EXPO '88," a trade show and conference for gas and electric energy conservation for commercial and industrial uses, in Milwaukee, Wisconsin. Sponsored by ANCO of Wisconsin. For more information: Kevin S. Anderson, Energy EXPO '88, ANCO, Public Service Building, 231 W. Michigan, Room 226, Milwaukee, Wisconsin 53201, 414-221-4801.

November 9-10 — Northwest Power Planning Council meeting at the Sheraton in Spokane, Washington.

November 18-19 — "Celebrate America's Rivers," a national conference in honor of the 20th anniversary of the national Wild and Scenic Rivers System, in Alexandria, Virginia. For more information: Suzanne Wilkins, Kevin Coyle or Ken Olson, American Rivers, 202-547-6900.

November 18-19 — "The Public Trust and the Waters of the American West: Yesterday, Today and Tomorrow," a continuing education conference at Lewis and Clark College in Portland, Oregon. For more information: Laurie Mape, Northwestern School of Law of Lewis and Clark College, 10015 S.W. Terwilliger Boulevard, Portland, Oregon 97219, 503-244-1161, extension 629.

November 29-December 3 — "Housing for the 90s" at the Sheraton Tacoma Hotel, Tacoma, Washington. Sponsored by the Energy Business Association. For more information: Patricia Anderson, Energy Business Association, 420 Maritime Building, 911 Western Avenue, Seattle, Washington 98104, 206-622-7171.

A more detailed calendar of Council committee meetings and consultations is carried each month in *Update!* See order form on back cover.

Compiled by Ruth L. Curtis

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The Northwest Power Planning Council is required to develop a program to restore the Columbia fisheries and a regional electric energy plan, to be carried out by the Bonneville Power Administration, emphasizing cost-effective conservation and renewable resources.

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COUNCIL PUBLICATIONS ORDER FORM

Please send me a copy of the following publications of the Northwest Power Planning Council. (Note: not all publications are available immediately, but they will be sent to you as soon as possible.)

Publications

- ☐ 1987 Columbia River Basin Fish and Wildlife Program
- ☐ (88-22) Amendment Regarding Protected Areas and Response to Comments Received
- ☐ (88-10) Issue paper on Grand Coulee, Willamette Basin, Palisades, Black Canyon and Anderson Ranch Wildlife Mitigation Plans
- ☐ 1986 Northwest Power Plan
- ☐ (88-21) Draft 1988 Update of the 1986 Northwest Power Plan
- ☐ 1988 Annual Report to Congress

Mailing Lists

Please add my name to the mailing lists for the following newsletters. (Note: do not check if you already are receiving them.)

- ☐ *Northwest Energy News* (this bimonthly magazine)
- ☐ *Update!* (monthly public involvement newsletter that contains the Council meeting agenda and a more detailed publications list)

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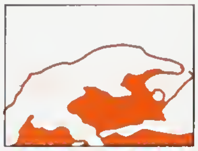

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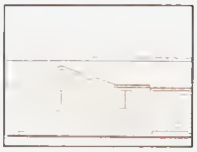

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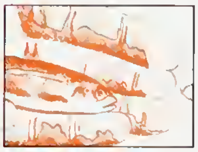

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Editor's Notes

1988 may go down in history in the Pacific Northwest and elsewhere as the year the climate began to pivot. Weather reports moved from the back pages to the headlines. Drought and long periods of record high temperatures singed most parts of the United States, including much of this region. And just when we were consoling ourselves with the knowledge that this, like all weather, would soon pass, the phrases "global warming" and "greenhouse effect" emerged.

Whether this summer is truly the first of a never-ending string of successively hotter and drier seasons cannot be known at this time. But the searing heat and brooding blue skies have certainly been taken as a warning; there is a price to pay for 100 years of atmospheric pollution. Exactly what that price will be is still anyone's guess.

The Council is looking at possible effects on the Northwest's energy scene from global warming. We begin that look with our lead story.

This issue's cover, which features an antique engraving, was designed by Stephen Sasser.

Is the Planet Baking?

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Illustration by Bonnie Mitchell

How might the "greenhouse effect" affect the Northwest's energy picture?

by Gordon Lee

Temperature records may not be the first things in the Northwest to go by the wayside if, as many believe, the greenhouse effect has already begun. The first casualties from global warming may be the region's traditional approaches to and assumptions about energy, economics and the environment.

The greenhouse effect—the global warming that's come from 100 years of man-made pollution—could reverse almost all fundamental assumptions about the Northwest and force politicians, economists and planners to rethink basic positions about commercial and social life in the region.

Long-standing assumptions about the region's economic, social and political structures could become obsolete if global warming changes the region's climate. Dryer weather, for example, could challenge fundamental notions about the Northwest economy, which for 50 years has been based on abundant, inexpensive hydropower. Water may be neither cheap nor abundant in a warmer, more polluted world, and traditional alternative resources — coal or natural gas — may be environmentally unacceptable.

Already, the greenhouse effect has intertwined politics, power planning and pollution in the Northwest. A citizens group in Washington is circulating an initiative petition that would limit construction of new fossil fuel plants in that state. Before any new power plant that emits carbon dioxide could be built, the measure would require that an equal or greater amount of that gas be reduced from other power sources in Washington. Many scientists suspect carbon dioxide to be the prime, but not sole, culprit in global warming.

The greenhouse effect has intertwined politics, power planning and pollution in the Northwest.

Washington's initiative drive followed moves on the national scene this summer. Senators Timothy Wirth (Democrat-Colorado) and Bennett Johnston (Democrat-Louisiana), chairman of the Senate Energy and Natural Resources Committee, in July introduced a bill that calls for a 20-percent reduction of carbon dioxide emissions from the United States by the year 2000 and a 50-percent reduction by 2010. Senators Robert Stafford (Republican-Vermont) and Max Baucus (Democrat-Montana) offered a bill at the same time calling for regulatory reforms that would eliminate the sale and use of chlorofluorocarbons (which — in addition to contributing to greenhouse warming — destroy the globe's protective ozone layer — see accompanying story) in the United States by the year 2000, reduce carbon dioxide emissions by 35 percent by 2010 and set a goal to generate all domestic power from non-polluting energy sources by 2050.

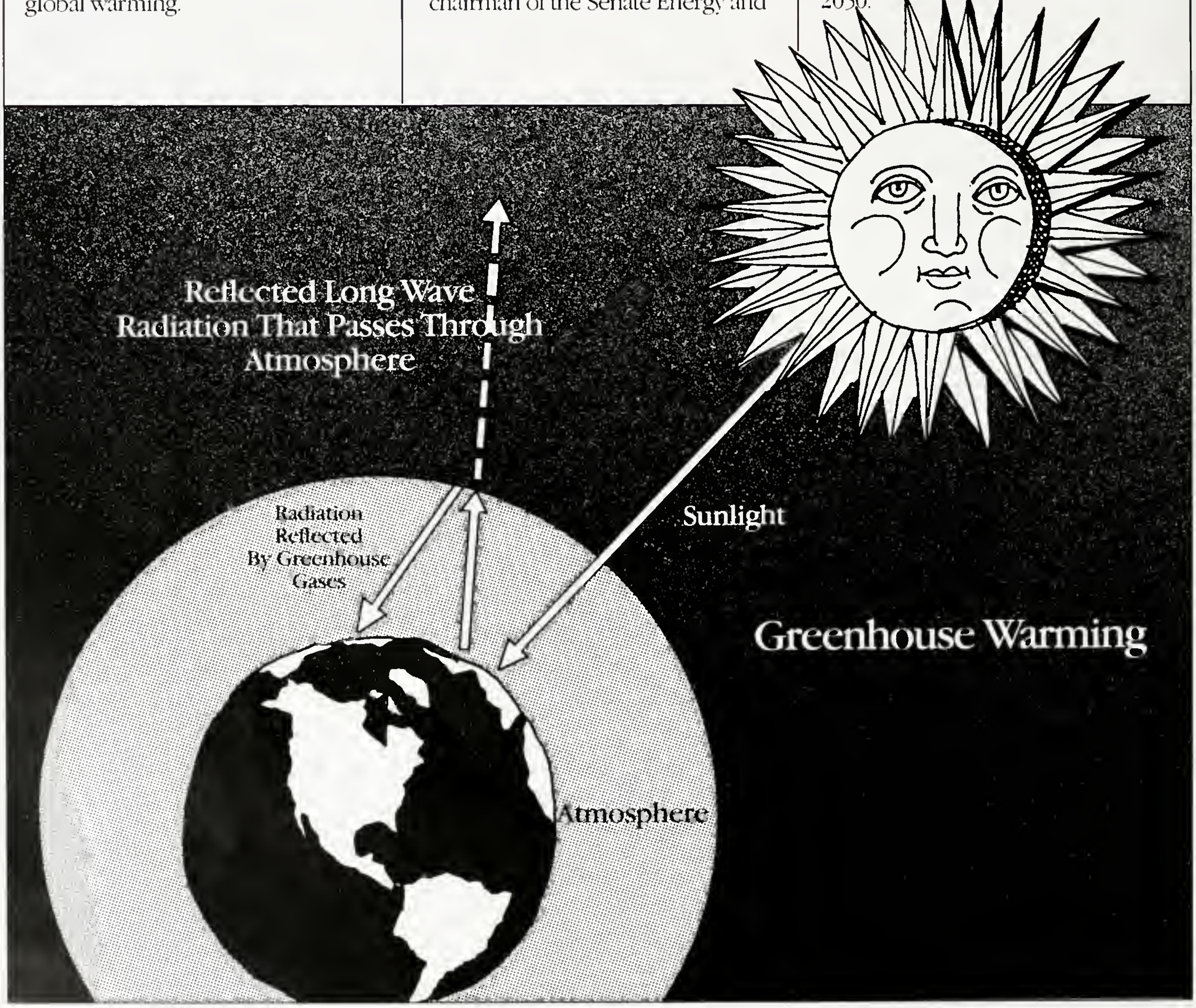

Reflected Long Wave Radiation That Passes Through Atmosphere
Radiation Reflected By Greenhouse Gases
Sunlight
Greenhouse Warming
Atmosphere

Illustration by Lyn Nance

The stakes are enormous. Warmer global weather could upset the rhythms of life as we know it by altering precipitation patterns, changing growing seasons, making fertile regions arid, flooding coastal regions and causing mass population migrations.

The Northwest Power Planning Council is in the early stages of addressing the greenhouse effect. "The Council plans to review all the current research and solicit advice from national experts," says outgoing Council chairman Morris Brusett of Montana. "In the coming year, we may publish issue papers for public comment and discussion on the implications of global warming for the regional power plan."

With its international implications, the greenhouse effect may be the most bedeviling problem the Council has tackled in eight years of regional power planning. It might change the Council's estimates of how the region should approach its growing energy needs and challenge the Council's fundamental economic assumptions about the region's energy future. Some resources that the Council includes in its portfolio of energy sources might appear less attractive under greenhouse assumptions.

But even though global warming may pose a matrix of new problems for the Council, it also represents an opportunity, says Ted Hallock, one of Oregon's members on the four-state planning organization. "We're a body that conceivably could influence everybody else. There's not another regional energy planning body like us anywhere else in the country. In the rest of the United States, it's everybody for himself. We have a chance to tell the nation, in choosing what goes into the power mix, that extraordinary attention must be paid to carbon dioxide emissions."

Council Chairman Tom Trulove agrees that the greenhouse effect provides the Council with an opportunity. "The solutions to the greenhouse problem are international in scope. They will require unprecedented cooperation by the industrialized and Third World nations to address all sources of the problem, from transportation, to energy production, to deforestation. The United States and the Northwest must provide leadership, and that will likely mean changes in emission standards."

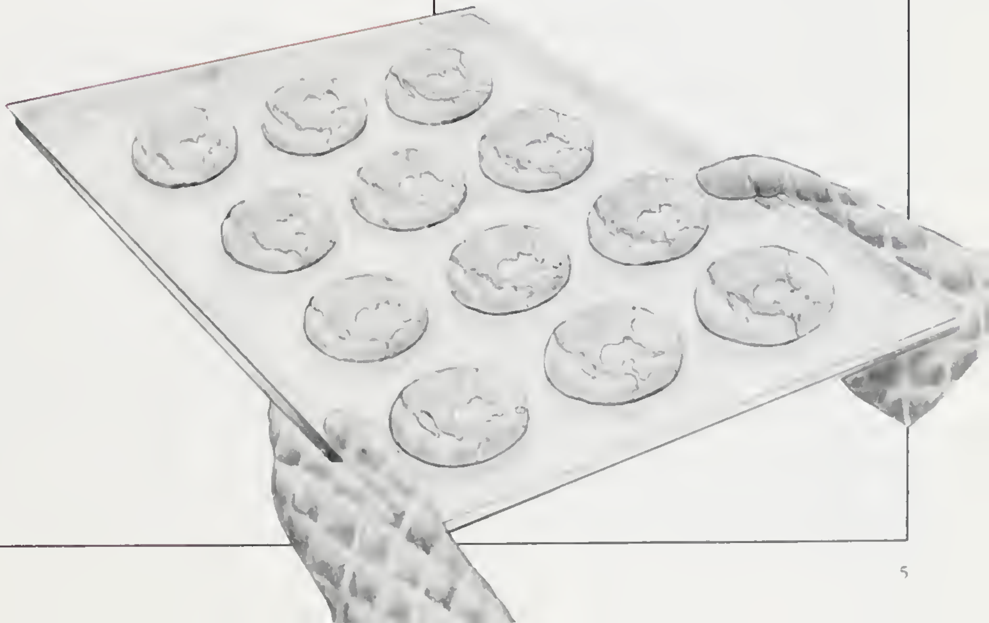
With its international implications, the greenhouse effect may be the most bedeviling problem the Council has tackled in eight years of regional power planning.

The greenhouse effect should force utility planners to take another look at how they estimate the real social and economic costs of a resource, says Senator Daniel Evans of Washington and former chairman of the Council. "No one does a good job of identifying the full costs of power plants. If I were [on the Council], I'd back off and try to look at whether these environmental costs can be identified and factored into the calculations."

Even though atmospheric scientists agree on the causes of the greenhouse effect, long-range weather predicting remains an inexact science. So, too, does long-range energy-price forecasting. As a result, pinpointing the implications of the greenhouse effect for energy resources in the Northwest involves as much speculation and guesswork as scientific analysis.

For some scientists, the jury is still out on whether global warming has started. Recent warming trends aren't outside of known heating and cooling cycles, they argue. But others are convinced the greenhouse effect is here. James Hansen, chief of NASA's Goddard Institute for Space Studies, told a Congressional committee in June that he was "99 percent" confident global warming has begun.

"We are struggling with not enough knowledge," says Evans. "Words like 'probably' and 'maybe' are being used."



But while politicians and scientists are uncertain about the timing and severity of global warming, the Council must address the issue soon, says Hallock. "I oppose coal-fired generators totally because of their carbon dioxide contribution to the atmosphere. It's a tremendous mistake to produce power for our convenience today and at the same time mess up the atmosphere for future generations."

Hallock acknowledges that the Council hasn't taken a position yet. At this point, his statements reflect personal beliefs about the greenhouse effect, not Council policy.

The 1980 Northwest Power Act charged the Council with coming up with long-range electrical energy plans for the region. Those plans try to identify how the Northwest can meet growing energy needs least expensively by envisioning a mix of conservation and generating resources that—depending on the rate of economic growth in the region—will provide electricity at the lowest cost to the region.

However, the greenhouse effect could change the Council's traditional least-cost planning calculations, Hallock predicts. Global warming adds a new wrinkle to the planning equation, so that new generating projects will be judged on a least-cost/least-carbon basis, he says. "I don't care about cost-effectiveness or least-cost alone. I've joined the Council to think about tomorrow."

If the rest of the Council takes that approach, gone may be the alternatives that the region turn to coal-fired electric plants or natural gas-fired turbines as ways to generate new power. Gone, too, may be potential resources that the Council hasn't even included in its regional energy plan, such as burning garbage or tapping into pockets of natural gas trapped in underground coal beds.

In their place may be an array of alternative resources whose economics looked daunting before they were viewed in light of the costs of avoiding global warming: conservation, nuclear power, geothermal, some cogeneration power and even solar and wind energy.

The region won't be able to avoid making these tough choices for long, because its energy surplus is shrinking. Two years ago, utilities could produce about 2,500 megawatts more power than Northwest customers consumed. That figure may stand below 1,000 megawatts today, and the Council calculates it could disappear as early as 1991. Under high economic growth conditions, the region could require as much as 13,000 average megawatts of power from new resources by the year 2010. That's enough electricity to light 13 cities the size of Seattle.

To further complicate matters, coal and gas-fired units account for 18 percent of the region's 43,360 megawatts of generating capacity today.

What is the greenhouse effect?

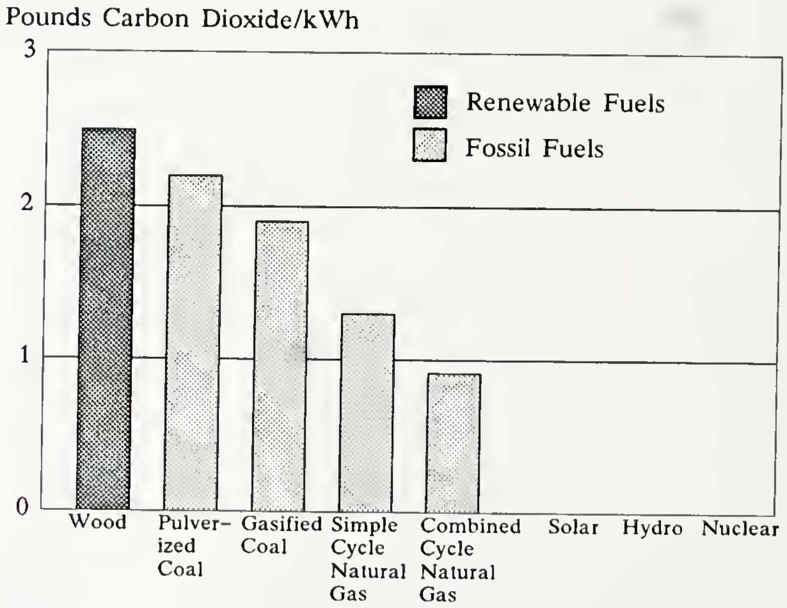
For Biblical scholars, the hardships that could come from the greenhouse effect are nothing new. The floods, pestilence, drought, mass population migrations and famines that many scientists forecast for the 21st century had their first run in the Old Testament.

But what's different this time is that righteousness alone won't get things back on track. Growing numbers of scientists predict that global warming already has started and that actions we take today can only postpone, not prevent, the trend.

To a certain extent, the greenhouse effect is a misnomer. Life on earth wouldn't exist without the atmosphere acting as a solar greenhouse. Gases in the lower atmosphere, particularly carbon dioxide, trap solar radiation as it bounces off the earth, keeping its surface warm. Without solar heat trapped by those gases, earth would be an inhospitably cold place.

That modest greenhouse effect has kept the planet's temperatures relatively stable for thousands of years. But what alarms scientists is

Carbon Dioxide Emissions
from Electrical Generation



Source: Washington State Energy Office

Graphs by: Ruth L. Curtis

the rapid change the atmosphere has experienced during the past 100 years. Since the start of industrialization, when people began to burn fossil fuels in a big way, increasing amounts of carbon dioxide have been pumped into the atmosphere. Those emissions, from factories, automobiles and power plants that run on fossil fuels, have helped increase the concentration of greenhouse gases.

During the same period, worldwide deforestation has cut into nature's ability to handle greater amounts of carbon dioxide. When forests are leveled and the trees left to burn or rot, that not only adds carbon dioxide to the atmosphere, it also reduces the amount of the gas that is converted to oxygen during photosynthesis. The United Nations Food and Agricultural Organization estimates that between 0.6 percent and 1.5 percent of the world's existing tropical rain forests are cleared each year. That's equal to 40,000 square miles, an area roughly the size of Virginia.

In addition, some fossil-fueled processes have by-products that compound the greenhouse effect. Coal combustion, for example, can create acid rain, which—when it falls—defoliates forests, further depleting nature's capacity to reduce carbon dioxide.

Some facts behind global warming are not in dispute. Worldwide atmospheric levels of carbon dioxide have jumped 25 percent since preindustrial times. The earth's temperature has risen nearly 1 degree Fahrenheit during the past 30 years, and it is warmer today than at any time since measurements began 130 years ago. Compared to the 30 years ended in 1980, the world's mean temperature has risen just under 1 degree in the last year and a half alone. The century's four warmest years have been in the 1980s; six out of the 10 warmest years have taken place since 1978. And 1988 is likely to be the warmest yet.

Atmospheric scientists point to high concentrations of several gases as the culprits. Carbon dioxide accounts for about half of the warming, methane for 20 percent, and nitrous oxide, chlorofluorocarbons and lower atmosphere ozone are responsible for the remainder.

Many atmospheric scientists believe the greenhouse clock already is ticking.

Recent computer models, created by the World Resources Institute, suggest that the earth's average temperature eventually will rise from 3 degrees Fahrenheit to 8 degrees Fahrenheit, if greenhouse gases double the preindustrial concentrations of carbon dioxide. Most of the dramatic temperature increases would take place at higher latitudes. Those models, and similar computer projections created by other scientific groups, predict the world's carbon dioxide level is likely to double within 50 to 100 years.

That would be a staggering climate shift. A 5-degree rise would put earth's climate beyond anything in human experience, making it as warm as the dinosaur age, 65 million years ago.

Almost all the earth's climate patterns could shift even if the temperature climb doesn't hit 5 degrees. Rainfall and monsoon patterns would shift. So would ocean currents and growing seasons. Polar ice caps might melt and sea levels could rise as much as three feet over the next 100 years, flooding coastal regions and fouling nearby water tables, according to Jessica Mathews, vice president and research director at the World Resources Institute.

Many atmospheric scientists believe the greenhouse clock already is ticking. Even if all carbon dioxide emissions stopped tomorrow, a global temperature rise from 1 degree Fahrenheit to 3 degrees Fahrenheit is inevitable, Mathews calculates. And since the rate of greenhouse gas emissions is accelerating, additional temperature jumps will come faster than in the past. That means speedier changes in climate and less time for societal and ecological adaptation.

But what global warming means for the Northwest remains unclear. Different weather patterns may translate into a dryer or warmer climate in the region. On the other hand, they could mean the Northwest will receive more rainfall than today. Scientists just don't know.

"You won't find any predictions for the Northwest," says Ron Neilson, an Oregon State University atmospheric scientist who's taken a leave to work on long-term global warming research for the Environmental Protection Agency. "All agree on temperature increases for the region, but they disagree on the rainfall implications."

The disagreements come because scientists are unsure what global warming will do to upper atmospheric winds such as the jet stream.

The jet stream, a long current of high-speed westerly winds seven to 10 miles above the earth's surface, plays a major role in the Northern Hemisphere's weather patterns. It generally enters North America near the mouth of the Columbia River, and many of the hemisphere's storm tracks follow its meandering path.

The Northwest's rainfall depends on the jet stream. If global warming were to push the jet stream away from the region, precipitation patterns would change. But it's still a puzzle whether warmer temperatures will speed or slow jet stream winds or cause them to depart from their traditional path.

HOLEY OZONE!

by Gordon Lee

Curbing carbon dioxide emissions into the lower atmosphere is only part of the answer to slowing the greenhouse effect, scientists say. Industrialized societies also must stop using chemicals that erode the upper atmosphere's protective layer.

Made up of a paper-thin sheet of ozone 15 miles above the earth's surface, that layer is all that shelters the earth from the intense ultraviolet radiation of the sun. Only three millimeters thick, it acts as a giant sunscreen filtering out ultraviolet rays before they heat up the lower atmosphere and damage plant and animal life.

That layer is fragile. Just as the lower atmosphere is warming as a result of greenhouse gases, so the ozone layer is jeopardized by 20th century chemical interactions. The culprit is chloroflurocarbons, the gas that since the 1930s has gone into refrigerator and air conditioner cooling systems and has been a prime component of plastic foam.

When released into the atmosphere, chloroflurocarbon molecules float free until they hit the upper atmosphere, where—under the right conditions—they act as high-altitude hit men. When it bumps into the ozone layer, an atom in a chloroflurocarbon molecule strips one of the three oxygen atoms in ozone.

The first warnings about this phenomenon came in 1974, but it wasn't until 1985 that there was concrete evidence that chloroflurocarbons are depleting the ozone layer. That's when a team of British scientists noticed a hole had formed in the layer over Antarctica. The hole, now as large as the continental United States, forms in September and lasts three or four months. The hole has gotten larger and lasted longer in the years since, scientists say.

If the ozone layer continues to shrink, the amount of ultroviolet radiation that hits the earth will jump dramatically, according to scientific projections. Skin cancer rates will go up. Since ultraviolet exposure weakens the human immune system, people's resistance to disease will drop.

But the biggest loser may be the plant and organic life at the base of the earth's food chain. Research suggests the one-celled plankton that makes up the bulk of life near the surface of oceans might not be able to adapt to greater amounts of radiation. Other research says that bacteria needed by some plants to process nitrogen wouldn't be able to survive long-term ultraviolet exposure.

The United States and several other countries banned chloroflurocarbons as an aerosol propellant in 1978. But that accounted for only a fraction of the world's use of the substance.

U.S. producers account for 30 percent of the world's chloroflurocarbon output.

Last September, the United States and 33 other countries pledged to cut chloroflurocarbon emissions 35 percent to 50 percent by the end of the century. But that may be too little, too late. According to estimates by the Environmental Protection Agency, world production needs to be cut by 85 percent just to keep chloroflurocarbon at its current atmospheric concentration.

Implications for power planning

The greenhouse effect likely will overturn traditional power planning assumptions. Up until the early 1960s, utility planners judged energy resources primarily on two criteria, price and availability. Thereafter, they began to factor environmental costs into their equations. But the greenhouse effect could put a new wrinkle into their equations, forcing planners to include carbon dioxide and other gases in the cost mix.

Power plants that burn coal, natural gas or oil all produce carbon dioxide and other gases. Cleaning up those emissions will add to the costs of the plants.

On the other hand, hydropower and nuclear plants, which produce no carbon dioxide, are more competitive in a greenhouse scenario. So are conservation and other renewable resources, such as wind, solar, tidal and geothermal power.

But those alternatives aren't risk-free. Nuclear power raises a host of safety and disposal questions. Hydropower might become less reliable if the greenhouse effect makes some regions drier. Warmer weather also may change wind patterns, making wind turbines more difficult to site.

Solar power, too, may prove to be unreliable if global warming causes more water to evaporate and increases the world's cloud cover.

"There are two immediate questions," says Ed Sheets, the Council's executive director. "Will there be changes in federal regulations regarding carbon dioxide emissions? And could that change the cost or availability of new resources?"

Council vice chairman Jim Goller of Idaho says that those questions should color the Council's agenda. "Looking at the increased greenhouse effect is a proper role for the Council. We need to get the facts before all concerned parties to make an informed decision. The Council should be a player in the international effort."

> "Looking at the increased greenhouse effect is a proper role for the Council. We need to get the facts before all concerned parties to make an informed decision." — Jim Goller

The Northwest Power Planning Council has factored an array of environmental costs into its planning assumptions. But greenhouse assumptions weren't part of the environmental equation when it drew up its most recent outline of how the region should meet growing power needs over the next 20 years. Under conditions of high economic growth (which the Council feels are unlikely to occur), the region will need to build 12 large coal units by the year 2005, according to the 1986 Power Plan.

Those plants won't be needed if the Council identifies cost-effective alternatives. However, if no alternatives emerge, construction on the first of those plants would have to start in 1995. Under medium-high economic growth conditions, the region would need the power from two new coal plants by 2005.

With its reliance on hydroelectricity, the Northwest is particularly vulnerable to shifts in weather patterns. Some 70 percent of the region's energy comes from hydropower, which means that a drier climate could force the region to rely on other power sources for a larger portion of its load.

Moreover, a drier climate could prompt the region to reduce its estimate of "firm" power, which is the amount of energy that hydropower dams can produce even if there were a repeat of the driest years on record. While the Northwest's dams produce an average 16,400 megawatts of energy today, only 75 percent of that total is considered firm. That's because utility planners have figured that the system would produce only 12,300 megawatts if the region sees a repeat of the worst known water years.

The greenhouse effect could make those parched years seem lush and force the region to lower the amount of power it could guarantee to customers. That, in turn, would change the region's rate and revenue picture dramatically. Because its delivery can be guaranteed in dry times as well as wet, firm power is more expensive than nonfirm power. If the system has less firm power, utilities would have to turn to more expensive resources to make up the difference.

By raising the costs of conventional power sources, the greenhouse effect may give a boost to energy conservation efforts in the region.

Conservation has played a big role since 1980, when Congress passed the Northwest Power Act. That bill treats conservation as the preferred resource for the region, and says it's a wise investment even if it costs 10 percent more than the next most-competitive new resource because of its environmental acceptability.

The Council in the past has figured that conservation measures make economic sense if they cost 5 cents a kilowatt-hour or less. That's what it would cost to build a medium-sized coal-fired thermal plant, the most expensive resource the Council includes in its plan.

But that cost doesn't include measures to deal with carbon dioxide emissions, which may boost the price of a new coal plant to 7.5 cents or 8 cents a kilowatt-hour, notes Marc Sullivan, head of the Northwest Conservation Act Coalition.

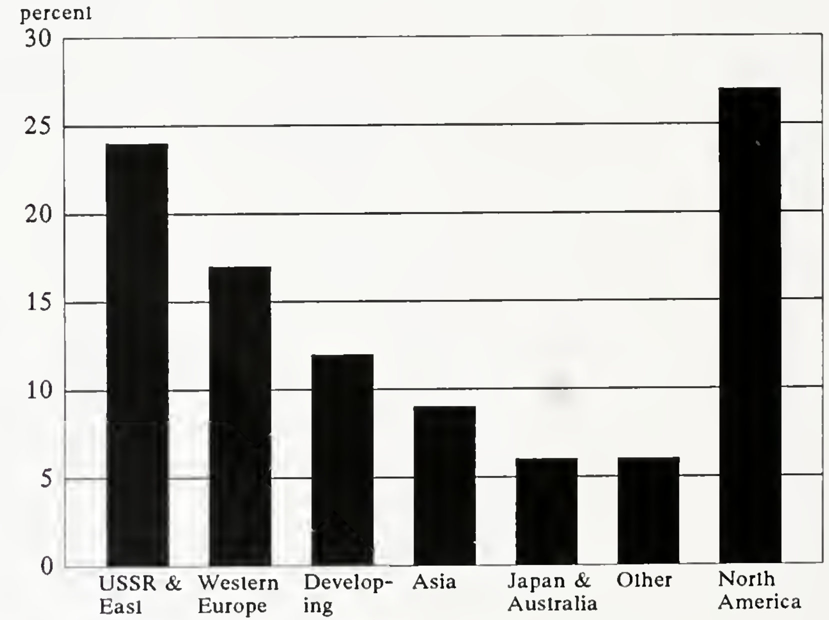
In that context, conservation becomes more attractive. "If the 10 percent cost advantage that conservation has been given in the Act were added to these marginal costs, that brings the figure up to 10 cents a kilowatt-hour," he says. "That makes a big difference in the amount of conservation supply."

> With its reliance on hydroelectricity, the Northwest is particularly vulnerable to shifts in weather patterns.

Jim Litchfield, director of the Council's power planning division, agrees that the greenhouse effect may make conservation more appealing. But conservation will take up only part of the slack if the region has to turn to non-fossil fuels, he cautions. "If we tried to meet our high-growth demand without thermal, we'd need to find roughly 10,000 megawatts. Even if we doubled the region's conservation potential to 4,000 megawatts, we'd still have to acquire 6,000 megawatts."

That's as much power as six cities the size of Seattle would consume, and it underscores the challenge facing the Council and other utility planners. If fossil fuels are removed from the energy picture, the region — under certain high-growth conditions — would have to turn to other resources to meet additional load. Some would be known and tested. Others would be new.

The Council and other utility interests are in a unique position to chart a path through this changing energy environment. But what's different this time is that the route will be characterized by many more unknowns than in the past. ■



Global Distribution of Carbon Dioxide Emissions – 1980

Source: Electric Power Research Institute

STRETCHING the River

Making the most of the region's hydropower.

by Dulcy Mahar

Not only is hydropower the Northwest's richest electricity resource — it supplies nearly three-quarters of the region's electricity — but it is also the cheapest source of power.

Given that fact, an obvious question for power planners is: can the Northwest's rivers be "stretched" to produce even more power without adding dams.

In its 1986 Northwest Power Plan, the Northwest Power Planning Council said: yes, there is a way to stretch the river. In the plan's portfolio of new resources, the Council included a resource referred to as "Better Use of the Existing Hydropower System." If that title seems cumbersome, the shorter title in the graphs — "nonfirm strategies" — is downright esoteric.

The resource portfolio is a list of the new resources the Northwest should develop to meet increasing demand for electricity. The portfolio includes an assessment of how much of the resource will be available, a schedule for developing the resource and a sequence for development (based on acquiring the most cost-effective first). To make it into the portfolio, a resource must be judged available, reliable, cost-effective (in comparison with other resources) and environmentally acceptable.

Most of the resources in the portfolio have straightforward descriptive names such as conservation, hydropower, cogeneration and coal. They are clearly products or processes for conserving or producing electricity. But "nonfirm strategies" is more difficult to clarify because it is a management strategy to "stretch" the river.

In 1986, this strategy grabbed considerable attention, because it was added to the portfolio for the first time (the other resources had appeared in the 1983 plan). The plan included 700 megawatts of the nonfirm resource, more than enough to power a city the size of Portland.

This year, as the Council has evaluated the need for a technical update of the 1986 plan, the resource is once again the subject of public comment. Based on improvements in generating technology and declining fossil fuel prices, a preliminary staff analysis estimated that far more than 700 megawatts of electricity from "nonfirm strategies" may be available to the region. Because of the potential to "stretch" the river at a lower cost than some other power alternatives, the Council expects to be focusing on this issue in the next year.

Firm power versus nonfirm power

To understand what the Council means by "better use of the existing hydropower system" or "nonfirm strategies," one has to look at the Northwest's existing hydropower system.

The Northwest's existing dams have a capacity to produce approximately 30,000 megawatts, far more electricity than the region presently needs. The dams don't produce that much electricity because they don't have the fuel: falling water. Unlike the rest of the country, which is constrained by "capacity" (how many megawatts a power plant can produce to meet peak needs), the Northwest is constrained by fuel, the availability of water produced by snow and rain.

The Northwest currently consumes approximately 16,000 average megawatts of electricity, with about 70 percent of this from hydropower. The rest of the region's energy needs are met by energy conservation and thermal generating resources. No other region of the U.S. comes anywhere close to using such a high percent of hydropower, because no other area has the unique combination of mountains and rivers that together produce the falling water to drive a dam's turbines.

While the huge amount of hydropower has been an enormous economic boon to the Northwest—the region's average electrical rates are half those of the rest of the nation—there is a catch. More than any other resource, hydropower's availability depends on the weather, which, as Northwesterners can attest, is highly unpredictable.

In planning to meet firm loads (known demand for power based on contracts), energy planners can only rely on power whose delivery can be guaranteed. In the case of a thermal resource, planners can know the capacity of a generating plant and can make reasonable assumptions about what percent of capacity the plant can be expected to run at, taking into account normal shutdowns for maintenance and repair.

But while planners know the capacity of a dam's turbines, they don't know how much fuel they'll have to run those turbines, because this depends on the relative wetness or dryness of the weather. To estimate how much energy the rivers can be guaranteed to produce annually, Northwest energy planners use the "critical water standard." Critical water refers to the amount of water available to produce hydropower in the driest period on record.

To calculate that amount—which is about 12,300 megawatts—planners have looked at the driest four-year sequence since record keeping began in 1879. That period occurred from 1929 to 1932. A sequence is used to determine critical water because it takes consecutive years of low water to produce the lowest level.

Thanks to storage dams built on headwater streams in both the United States and Canada and a treaty between the two nations to share stored water, about 40 percent of the average runoff of the Columbia River Basin can be stored. Thus, isolated dry years are not devastating to the energy system (although they may cause problems for fish and irrigation). Stored water in the reservoirs can be released to run the turbines and, if the following fall and winter are normal and the reservoirs refill, power system needs can be met. Power supply problems occur only when there is a sequence of years with water so low that reservoirs cannot adequately refill.

So energy planners use the critical water standard to determine how much hydropower they know can be delivered annually. Because this power is guaranteed, it is called "firm power." However, in each year where there is more water than the critical level, there is the potential for producing more hydropower. This is called "nonfirm power" (or sometimes "interruptible power") because it depends on the weather. In an average water year, there are approximately 4,100 megawatts of nonfirm power available, enough power to supply four cities the size of Seattle.

More than any other resource, hydropower's availability depends on the weather, which, as Northwesterners can attest, is highly unpredictable.

Uses of nonfirm power

Nonfirm power isn't wasted, but it can't be used to meet firm power needs or to avoid the construction of new resources to meet those needs, because the Northwest must have a guaranteed power source. Public health and safety depend upon a reliable supply of residential and commercial electricity. The economy depends to a significant degree on the availability of a reliable supply of electricity to industry and agriculture.

Nonfirm power is sold primarily to the aluminum industry, which can run at fuller production when such power is available; to Northwest utilities that can shut down expensive thermal plants when nonfirm power is available; and to utilities in California, which also use this power to shut down their more expensive thermal resources.

There are two obvious advantages to "stretching" a river to produce more firm power. First, hydropower from the Northwest's existing federal dams is the cheapest electricity. It costs little more than half a cent per kilowatt-hour. What's more, this is largely a fixed cost—like the payments on a fixed-rate mortgage—which means the price will remain relatively constant even with inflation.

Taking inflation into account, over time the price will be closer to a quarter of a cent compared to the cheapest new hydropower at costs between 2 and 3 cents or electricity from a coal plant, which costs between 4 and 5 cents.

The second advantage is that additional power from the existing system does not increase the number of dams with their serious impacts on fish and wildlife.

Firming up nonfirm power

Nonfirm power could be converted to a firm power resource if it could be backed up with some other resource that would operate in poor water years when nonfirm power is not available. To the extent that some portion of nonfirm power could be safely and economically firmed up with a back-up power source, it could be used to meet firm loads and could displace or delay the need to build more expensive thermal resources in the Northwest.

To determine the amount of nonfirm power that can be firmed up, energy analysts compute the percent of time additional hydropower is likely to be available and in what amounts. Given that a back-up system will have costs of its own, the analysts must also calculate what mix of the relatively cheap hydropower, used in conjunction with the more expensive back-up system, will still result in an average system cost lower than electricity generated from coal, the highest-cost resource currently in the power plan.

Several systems have been looked at to back up nonfirm power. These include combustion turbines and other power plants, short-term purchases of power from other sources, load management (e.g., contracts to interrupt power in exchange for lower rates), or a mix of these and other alternatives. The Council's plan does not advocate a particular back-up system, but instead calls for the region to use the grace period supplied by the present power surplus to explore and develop the most appropriate back-up system.

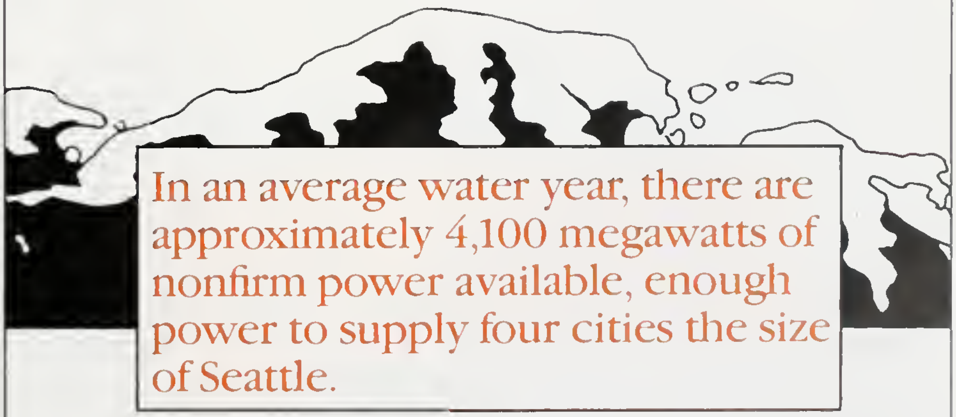
To avoid underestimating the costs of firming up nonfirm power, the Council staff calculated the cost of using combustion turbines, because they are the most expensive (but still cost-effective) back-up. Combustion turbines are gas- or oil-fired jet engines, similar to those on commercial aircraft, that are hooked up to a generator to produce electricity. They are cheap to build when compared to construction costs for a coal or nuclear plant, but expensive to run because of fuel costs. The more they are used, the more expensive they are.

However, if they are only run a small portion of the time (the 1986 plan estimates a back-up system for nonfirm power would be needed 16 to 20 percent of the time), their high fuel cost is incurred only for the percent of time they are run. The rest of the time the electricity would be produced by the available nonfirm hydropower, and its cost would be calculated in terms of the lost revenues from nonfirm sales to California.

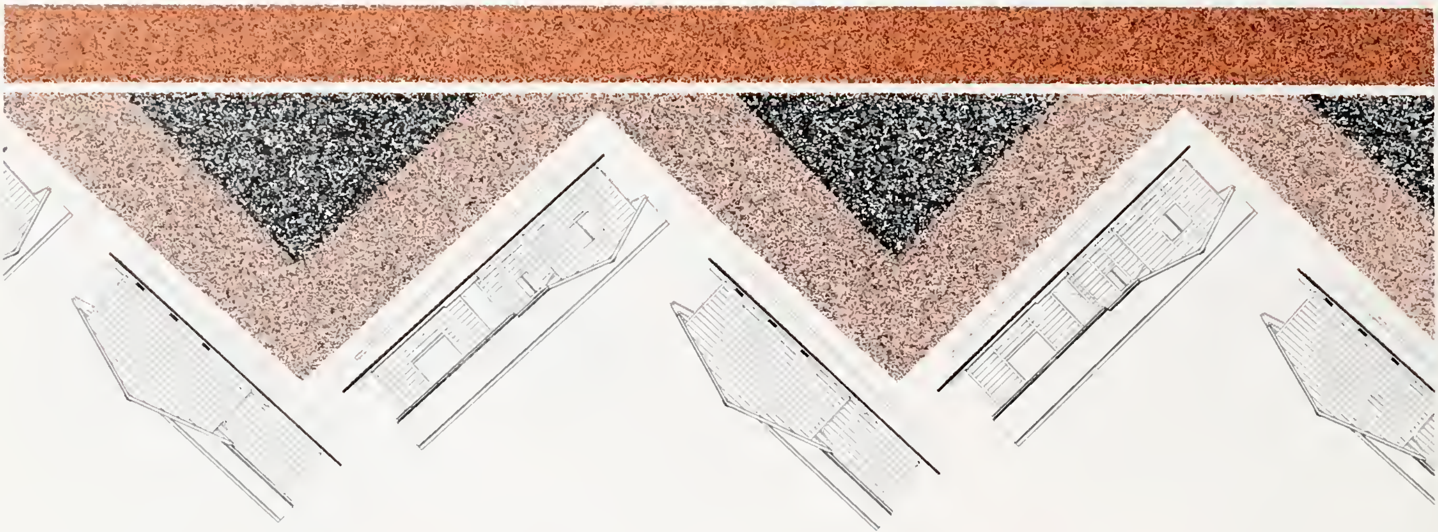
The cost of the two resources together makes for a firm power supply that is more expensive than firm hydropower and conservation, but cheaper than building a coal plant. Theoretically, a coal plant could be constructed to back-up nonfirm hydropower, but much of the cost of a coal plant is in fixed capital costs of construction. Thus, these costs would be incurred whether or not the coal-fired units were operated. Of the thermal alternatives for backing up nonfirm power, combustion turbines, with their lower fixed costs, appear to be most cost-effective.

Combustion turbines are used as place-holders for the resource portfolio for the purpose of evaluating costs. If cheaper back-up systems are available, they would be used. And growing concern for the "greenhouse effect" raises questions about the use of combustion turbines at all. While they produce about one-third of the carbon dioxide emissions produced by coal plants for each kilowatt-hour, and would be used a small percent of the time, the Council would have to weigh their environmental acceptability. But because there are a number of alternatives for backing up nonfirm power, the Council considers it a sufficiently reliable resource for inclusion in the power plan's resource portfolio.

Currently the region is selling nonfirm power as interruptible power at lower rates than firm power. It is not backing up nonfirm to meet contractual firm loads. The Council's power planning director, Jim Litchfield, described the issue succinctly at a public meeting in Boise this past summer: "The question we face is: is there a higher value use of the water (nonfirm) than we are making of it." Idaho Council member Jim Goller pointed out, "The Council is not advocating we go to combustion turbines, but we're using them as a base to cost out the resource." And Washington Council member Tom Trulove added, "One way of looking at it is that we've been building high-cost thermal plants here (in the Northwest) to preserve cheap nonfirm power that goes to California." ■



In an average water year, there are approximately 4,100 megawatts of nonfirm power available, enough power to supply four cities the size of Seattle.



INDIAN NATION

Super Good Cents housing comes to Northwest reservations

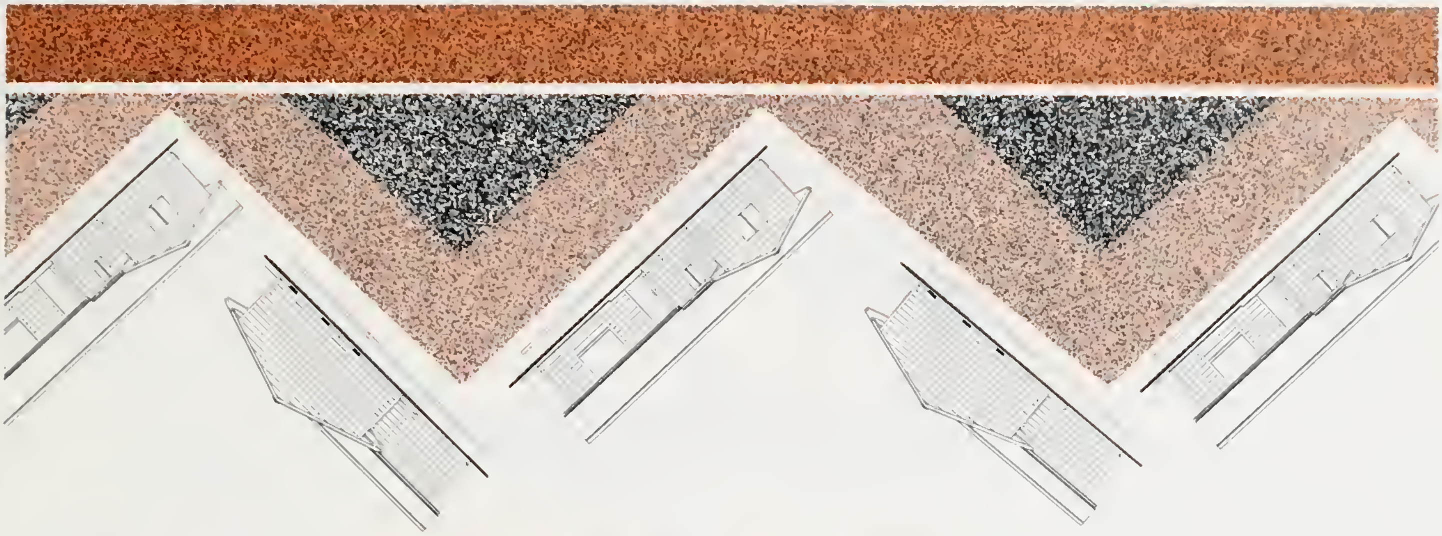
Something new came to the Northwest's Indian nations this year. For the first time, many of the housing authorities on the Indian reservations are taking part in the Super Good Cents program to build over 250 energy-efficient houses.

Super Good Cents is a marketing program sponsored by the Bonneville Power Administration to promote the efficient use of electricity in new construction. The program markets homes built to the Northwest Power Planning Council's model conservation standards. These homes use about half the electricity of conventionally built homes. Energy saved through their construction is one of the most cost-effective sources of new electrical power available to the Pacific Northwest.

Super Good Cents is available to Northwesterners through most of the region's utilities. Working with Bonneville, these utilities provide builder training, technical information, financial assistance to cover the incremental cost of energy-saving measures, quality control of the work being done (including approval of house plans and on-site inspections) and advertising to help sell the finished product. With 3,000 houses built in the Northwest through Super Good Cents, the program is credited with changing residential construction practices in the region.

The Nez Perce Reservation in Idaho was one of the first Indian communities to get involved with the program. In 1988, about 40 Super Good Cents homes were built. Another 40 homes are planned for next year. According to Jim Sueuga of the Clearwater Power Company, which serves the reservation, "There was a need for housing on the reservation, and the housing authority wanted to get as much as it could for its dollar. With Super Good Cents, they get good quality homes and also homes that folks can afford to live in because of their low operating costs." Sueuga also stresses that "from the utility's point of view, it helps us with our electric load. Efficient use of energy is what we want."

Illustration by David Rose/Design Council



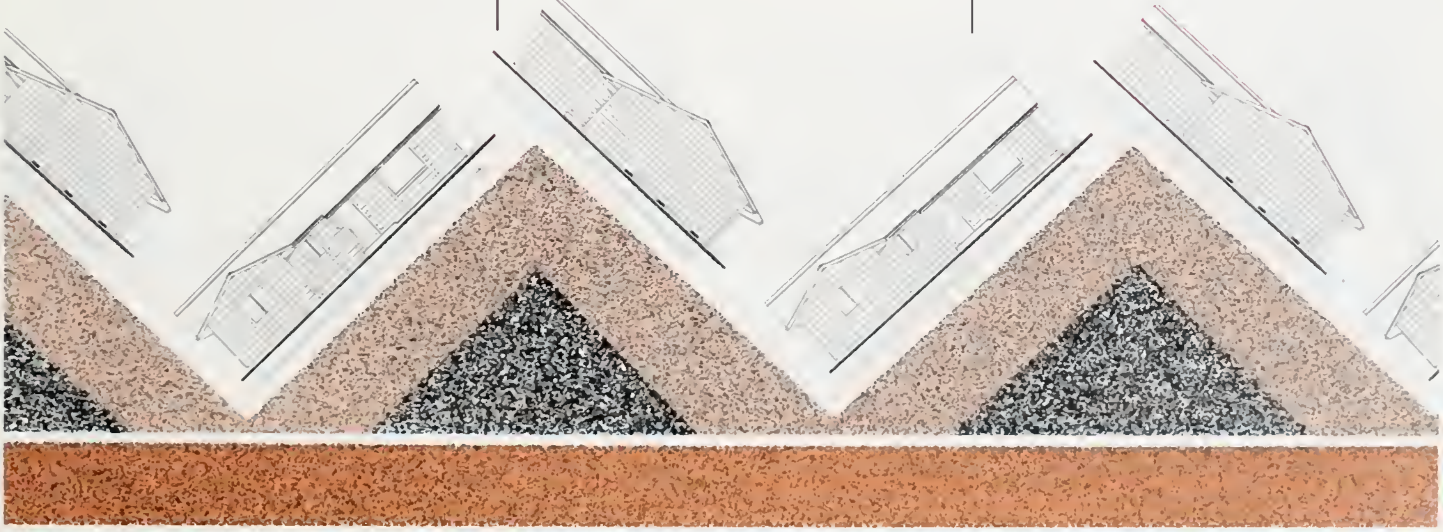
CONSERVATION

by Ruth L. Curtis

Money to help build these homes comes from the U.S. Department of Housing and Urban Development as part of an annual housing allocation. It is up to the reservation housing authorities to stretch that money as far as it can go. So one of the attractions of the Super Good Cents program is the cash payment Bonneville offers for each house certified. That payment ranges from $1,000 to $1,500 depending on the local climate. Melvin Wheeler, development inspector of the Nez Perce Housing Authority stressed that the "incentive offered is particularly attractive when you are building in quantity."

The housing authority on the Blackfeet Reservation in Montana, working with Glacier Electric Cooperative, has 75 Super Good Cents homes in the works. These homes are currently in the blueprint stage, with construction planned to begin this fall or next spring. Scott Sherburn, the executive director of the tribal housing authority, explains that "on the reservation, we have everything from very poor to reasonably good housing. We expect the Super Good Cents homes to be very good houses, but we will monitor them and see how they do."

Other reservations constructing Super Good Cents homes are Montana's Flathead Indian Reservation, working with the Flathead Irrigation and Power Project; Washington's Kalispel Reservation, in cooperation with Inland Power and Light; the Spokane Reservation, through Washington Water Power; and the Makah Indian Reservation, with the Clallam County Public Utility District. ■



SHORTS

Business in the Northwest is "astonishingly strong," if measured in employment figures and record high payrolls, report top executives in small and medium-sized manufacturing firms. One businessman remarked that, "I've been in business 45 years, and I've never seen anything like it." The biggest problems identified by these manufacturers were increasing costs of raw materials and "just trying to get the orders out the door." (Source: *Marple's Business Newsletter*, 911 Western Avenue, Room 509, Seattle, Washington 98104, 206-622-0155.)

"Smart windows" could reduce energy required for building heating and cooling by 25 percent, lighting by 50 percent and peak electrical power requirements by 30 percent, according to scientists at Lawrence Berkeley Laboratories in California. Experimental windows filled with foamlike silicon materials called aerogels may have the insulating capability of a 4-inch-thick wall. Windows that change color when an electric current (supplied by photovoltaic panels) is applied can block excess sun and admit daylight as needed. While too expensive to manufacture for broad distribution today, scientists expect many of the developments to be in use in only a few years. (Source: *The Register-Guard*, Eugene, Oregon.)

A poster presentation on indoor air quality prepared by Northwest Power Planning Council and Bonneville Power Administration staff received international recognition at this fall's Conference on Healthy Buildings, in Stockholm, Sweden. The conference, sponsored by the International Council for Building Research and organized by the Swedish Council for Building Research, pulled together energy and building specialists from around the world. The Northwest's poster was honored for both technical merit and design presentation.

Emerald Peoples' Utility District's new headquarters in Eugene, Oregon, won national recognition for energy design innovations this fall. The award, one of 69 given nationally, came from the U.S. Department of Energy. Emerald's building relies on passive solar heating and daylight for interior lighting. It will beat Oregon's state building code by 33 percent, according to estimates. (Source: *Clearing Up*, Box 9157 Queen Anne Station, Seattle, Washington 98109, 206-285-4848.)

The U.S. District Court in Oregon has approved a settlement of the 20-year-old U.S. versus Oregon litigation. The case clarifies Indian and non-Indian rights to harvest fish in the Columbia River. Parties to the legal action include the states of Oregon, Washington and Idaho and the Yakima, Warm Springs, Nez Perce, Umatilla and Shoshone-Bannock tribes. Idaho and the Shoshone-Bannocks had objected to parts of the settlement, but the Court found that their concerns were adequately covered by the agreement.

Emerald People's Utility District's new headquarters in Eugene, Oregon.

MCS

Energy-Efficient Homes for the 21st Century

The party's almost over for the Northwest's electric energy surplus. After more than a decade of producing more power than it consumes, the Northwest will come up short as early as the mid-1990s.

An end to the surplus could disrupt the Northwest economy, many of whose industries thrive on cheap electricity. With power in shorter supply, rates could rise, forcing some industries to close and ending the price advantage that's been used for 50 years to lure major employers to the region. Other operations could leave the region in search of more competitive business climates. Still others might scale back operations and lay off workers.

Most alternatives to avert shortages aren't attractive. The Northwest can obtain additional power by building new coal-fired electric plants. It can revive partially built nuclear plants that have been put in mothballs. It can build natural gas-fired electric turbines. It can dam up more rivers or buy expensive power from out of the region.

Most alternatives to avert shortages aren't attractive.

All of those alternatives carry high costs and would take a long time to put in place. Most would meet with substantial political or environmental opposition.

But there's another alternative — energy conservation. It's cheaper. It avoids having to build new generating plants. It's environmentally safe, and it keeps customers' bills down.

In this context, conservation doesn't mean people must turn down their thermostats or wear sweaters. It means using less electricity to achieve the same comfort level.

Building energy-efficient new homes and buildings is a key part of any conservation effort. Structures built today last a long time. Built right, they'll slow down the region's energy appetite.

The Northwest has come far in making energy efficiency a keystone in its building codes. But more work remains, and over the next year state and local officials will be asked to add more energy-saving features to the region's building practices.

What are energy-efficiency standards?

Energy-efficiency standards are measures designed to make new, electrically heated homes and commercial buildings super energy-efficient.

They are a low-tech, common-sense way to save electricity. By building structures that conserve energy, everybody wins — homeowners see lower electric bills, utilities avoid investing in expensive new generating plants and builders offer quality products that are likely to rise in value faster than conventional homes.

In simple terms, the standards set energy-efficiency levels for new buildings. They don't tell builders how to construct homes or offices. Instead, they outline how much power those buildings should consume. Builders are free to meet those levels through their own ingenuity. Most turn to specific, well-tested, energy-saving features, such as more insulation, thermal windows and new-generation furnaces and heat pumps. Homes with those and other features take one-third less electricity to heat as other new homes, with no sacrifices in comfort or air quality.

The standards are tailored to three climates in the Northwest. In the mild climate west of the Cascade Mountains (Zone 1) houses don't need as many heat-saving features as in Zone 2 (east of the mountains) or Zone 3 (farther east in Montana and Idaho).

Why do we need efficiency standards?

The Northwest produces more power than it consumes, which helps keep rates half those of the rest of the nation. But that surplus could turn into a shortage as early as the mid-1990s if the region's population and economy continue to grow.

Conservation is the cheapest way to meet that expected growth in electricity demand and stretch the region's surplus. Conservation measures typically cost from 2 cents to 3.5 cents a kilowatt-hour, below or near the average cost of all electricity in the region today. Alternative resources, on the other hand, are costlier — 3.5 cents to 5 cents a kilowatt-hour — and would push rates higher if their power were added to the regional pool.

Conservation also slows growth in demand. Reduced demand translates into lower, more stable electric rates in the region.

But unless new buildings are energy-efficient from the start, we lose the chance to reap savings during their lifetimes. For today's typical new home, that's at least 70 years of lost energy savings. While buildings can be retrofitted with efficiency features, that's more expensive and the energy savings is less than if they are built in at the front end.

How did the standards come about?

Congress directed the region to develop standards for energy-efficient buildings when it passed the Northwest Power Act in 1980.

That legislation, which created the Northwest Power Planning Council, mandated that the Council come up with model conservation standards to guide the region's building industry.

The Act also treated energy conservation as a resource that utilities could buy, much as they obtain power from generating plants or from other utilities.

Conservation is the Act's preferred resource. Even if conservation measures cost 10 percent more than the next most competitive resource, they're a smart investment, Congress said. That's because power obtained from conservation doesn't require new lines or transmission equipment. It doesn't pollute, nor does it kill fish.

The Council adopted the standards in 1983. They require that homes be less expensive to own and operate over their lifetimes than ones built to current building codes.

The Council hoped states and local governments would adopt the standards into their building codes. The early results were mixed. Tacoma in 1984 became the first city to make the standards part of its building code. Several smaller cities followed suit. Oregon and Washington tightened their state codes, but not to the level of the standards. Numerous cities in Idaho adopted the standards. The standards also are law in Missoula, Mont.

The Council in 1986 expanded the conservation program. Instead of trying to change building codes, it concentrated on altering builders' habits. If conservation could become standard building practice it would more likely be included in codes, the Council believed.

That shift brought about the "Super Good Cents" marketing effort that the Bonneville Power Administration offers through utilities in the region. The program, called "Comfort Plus" by Puget Sound Power & Light Co., offers builders marketing and financial help to attract them to energy-efficient homes. Houses built and marketed through the program get energy-efficiency certificates from electric utilities. Bonneville hopes certification will convince lenders, sellers and buyers that energy-efficient houses are more valuable because they cost less to heat and operate.

Q

How much energy would these homes save?

Over the next 20 years, the Northwest could save as much as 500 average megawatts if all new electrically heated housing were built according to the efficiency standards.

That's the output from a medium-sized, coal-fired thermal electric plant. However, conservation measures would cost half the price of electricity from a new coal plant.

Put differently, a new three-bedroom, 1,800-square-foot home in Seattle would consume about 8,200 kilowatts in an average weather year if it were built to current codes. It would use 5,400 kilowatts if it were built to model conservation specifications.

East of the Cascades, an average new house built to current code would consume 12,400 kilowatts. One built to the energy standards would use 8,000 kilowatts a year.

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What's in it for builders now?

They get money to learn the latest techniques for building the high-quality, energy-efficient homes that today's buyers demand.

Energy-efficient features add $1,000 to $1,800 to the cost of building an average home in Washington. Obviously, most of those costs can be passed on to homebuyers, who recoup those dollars from money saved on electricity bills.

But to keep these homes competitive with other new construction and to encourage builders to adopt efficiency standards, Bonneville and the region's utilities through the "Super Good Cents" program, will pay builders next year up to $1,000 per house in Zone 1 and $1,250 in Zone 2. Those payments will phase out as builders and buyers become more accustomed to the standards.

In addition, Bonneville provides code-enforcement training to local governments that have passed laws denying electrical hook-ups to homes that use electricity for space heating and that don't meet the energy efficiency standards.

SHOPPING FOR RESOURCES

Won't their extra costs shut some potential buyers out of the market?

No. All it takes is an additional $150 in down payment and closing fees to get into a typical $81,000 energy-efficient home, compared with the price of getting into a conventional $80,000 home.

And that's the buyer's only additional outlay, since the monthly costs of efficient homes are less than other new homes.

Buyers of energy-efficient houses see immediate jumps in their monthly cash flows. During a typical weather year, a 1,650-square-foot house in Seattle built to the efficiency standards would have an average monthly heating bill of $19, two-thirds of what it would cost to heat a similar house built to current state code.

East of the mountains, that house would cost $27 a month to heat if it were built to energy-efficient standards, also two-thirds of the cost under the current state code.

At the same time, lenders are making it easier for people to buy energy-efficient homes. The Federal Housing Administration, for example, qualifies people for mortgages on energy-efficient homes who wouldn't qualify to buy a conventional house at the same price. With lower heating costs, those buyers can afford higher monthly house payments.

What benefits do energy-efficient homes bring?

Lower monthly electric bills are the main selling point of energy-efficient homes.

By purchasing energy-efficient homes, consumers also buy inexpensive insurance policies against future electric rate increases. If energy prices rise, the annual savings of a conservation standard home will be even greater than today. The more rates rise, the more the homes save.

Homes with that kind of protection should be worth more than other new homes. That makes them more attractive as investments and for resale.

In addition, energy-efficient homes reduce the region's demand for more power when the economy grows. The more homes that are built, the less each new structure adds to the Northwest's total energy demand.

Energy-efficient homes are more comfortable than ones built to current codes. They have fewer drafts. They are quieter. There's no moisture on their windows.

These homes also give a boost to local economies. Builders spend money locally when they construct energy-efficient homes. That won't be the case if utilities meet their power needs by investing in far-off coal-fired generators, offshore drilling platforms or British Columbia hydropower projects.

What about indoor air quality?

The air in energy-efficient houses must be as good as, if not better than, air in houses built in 1983, the year the Council developed the standards.

In the past, some observers have linked energy-efficient housing with poor indoor air and health hazards. That's a bum rap. Poor indoor air can be found in any residential housing, regardless of its energy efficiency. The presence of pollution sources in a home, not its energy efficiency or tight construction, is the factor that most contaminates indoor air. Current building and health codes in the region ignore this issue.

However, energy-efficient homes tackle the problem by avoiding the sources of pollution and requiring proper ventilation. Safe building products go into those houses. Their basements are insulated and sealed.

These measures work. A recent survey of new houses in Washington's Clark County found that only 2.5 percent of energy-efficient houses with tight basements had measurable levels of radon, a natural radioactive gas found in soil and water. That gas was in 25 percent of all non-weatherized new construction.

What about manufactured housing?

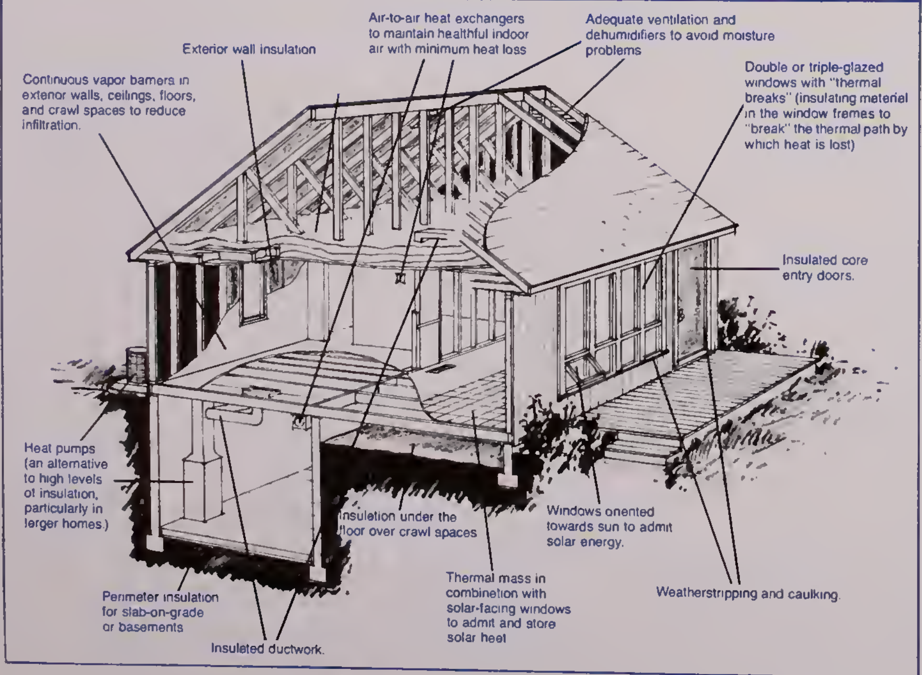
Manufactured housing is close to getting national efficiency standards that resemble the Northwest conservation guidelines.

Early on, builders worried that the higher cost of energy-efficient homes would push buyers toward lower-priced manufactured housing, which — because it comes under federal, not state, regulation — wasn't required to carry efficiency features.

But that market shift didn't take place, and the federal government, through the Department of Housing and Urban Development, is due to announce efficiency standards for manufactured housing early next year.

Moreover, Bonneville includes manufactured housing in its "Super Good Cents" marketing program, rewarding builders for putting up homes that meet the same standards it has set for conventional homes.

TYPICAL FEATURES IN THE ENERGY EFFICIENT HOUSE


Continuous vapor barriers in exterior walls, ceilings, floors, and crawl spaces to reduce infiltration.
Exterior wall insulation
Air-to-air heat exchangers to maintain healthful indoor air with minimum heat loss
Adequate ventilation and dehumidifiers to avoid moisture problems
Double or triple-glazed windows with "thermal breaks" (insulating material in the window frames to "break" the thermal path by which heat is lost)
Insulated core entry doors.
Heat pumps (an alternative to high levels of insulation, particularly in larger homes.)
Insulation under the floor over crawl spaces
Windows oriented towards sun to admit solar energy.
Perimeter insulation for slab-on-grade or basements
Insulated ductwork.
Thermal mass in combination with solar-facing windows to admit and store solar heat
Weatherstripping and caulking.

ARE ENERGY-EFFICIENT HOMES EXPENSIVE?

Are energy-efficient homes expensive? No. They cost no more a month than new homes built to the current state code.

Here's an example of new 1,650-square-foot homes built in Seattle:

	Current Code	Revised Code
Price:	$80,000	$81,000
Down payment (at 10 percent) and closing costs:	12,000	12,150
Monthly mortgage payment (11 percent, 30-year loan):	686	694
Monthly bill for electric heat:	29	19
Monthly property tax:	102	104
Monthly insurance costs:	21	21
Total monthly costs (before tax write-off):	838	838
Total monthly costs (after tax write-off):	641	639

Illustration by David Rose/Design Council

THE SALMON SLEUTHS

by Ruth L. Curtis

About $12 million to $16 million is spent each year to learn more about the extraordinary lives of salmon and steelhead in the Columbia River Basin. This money is used to gather and interpret data. It is fundamentally detective work, but it is known in the field as research. This research encompasses an incredible number of subjects including habitat requirements of fish, hatchery operations, fish diseases, harvest management, salmon and steelhead passage at dams and reservoirs, and fisheries genetics.

Two recent developments have made it easier for fisheries detectives to gather data on salmon and steelhead — the coded wire tag and the "PIT" (Passive Integrated Transponder) tag. The coded wire tag allows monitoring of specific groups of fish and has become one of the most important tools in harvest management. The actual tag is a small metal wire with a code etched into it that is implanted into the cartilage of the young fish's snout. A fin is clipped to indicate the presence of the tag.

When a fisherman catches a tagged fish or when it is trapped to be used for hatchery production, the head is sent to a lab. There, workers remove the tag, and, by studying the etched

Research efforts unlock mysteries of the deep.

MCS

Energy-Efficient Homes for the 21st Century

Where to turn for more information

IDAHO

Idaho Department of Water Resources
Divison of Energy Resources
Statehouse Mail
Boise, ID 83720
208-334-7900

Association of Idaho Cities
3314 Grace
Boise, ID 83703
208-344-8594 or toll free in Idaho 1-800-334-SAVE

MONTANA

Department of Natural Resources and Conservation
1520 E. Sixth Avenue
Helena, MT 59620
406-444-6697

Montana Local Government Energy Office
101 E. Broadway
Suite 513
Missoula, MT 59802
406-721-7294

OREGON

Resource Technologies Program
Oregon Department of Energy
625 Marion Street, N.E.
Salem, OR 97310
503-378-7809

League of Oregon Cities
P.O. Box 928
Salem, OR 97308
503-588-6550

WASHINGTON

The Washington State Energy Office
809 Legion Way, S.E.
Olympia, WA 98504
206-586-5013

Association of Washington Cities/Washington Association of Counties
1076 S. Franklin
Olympia, WA 98502
206-753-4137

Illustration by: David Rose/Design Council

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Research efforts unlock mysteries of the deep.

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code, can determine what stock the fish belongs to. This provides data about the return and survival rates of various species and stocks.[1] The information has been used to manage harvests, but is being used more and more in hatchery decisions. The tags can provide answers to questions about variables in hatchery operations, such as what diets tend to increase survival and when is the optimum time to release the fish.

Recently another type of tag has come into use in the Northwest—the PIT tag or Passive Integrated Transponder. These tags have been used for years to identify race horses, to route boxcars, and in computerized security installations. About five years ago they were reduced to a size that was small enough to use in fisheries research (about a quarter of an inch), and the National Marine Fisheries Service started using them to identify fish.

The PIT tag consists of a printed circuit board encased in glass that is inserted into the juvenile fish's body cavity. Each board and consequently each fish has a unique code. When the fish goes through a detection area at a dam, a radio frequency beam reads the code and identifies the fish.

PIT tags are used primarily to track juvenile fish through Columbia River dams. There is speculation that when a fish reaches adulthood, its body may reject the tag. But the advantage of the tag is that individual fish can be tracked as they migrate through the river system so fewer fish need to be tagged. In addition, once the tags are in place, the fish don't need to be handled or killed to recover the information. And, while the PIT tags are expensive and time consuming to encode and install, recovery of the information is considerably less labor intensive than with the wire tags.

Using the information

A great deal of research is now concerned with getting fish safely through or around the dams. This research centers on guiding juvenile fish successfully into bypass facilities to enable them to avoid turbines; attracting adult fish to ladders that help them over the dams; ensuring young fish survive being carried in barges around the dams; and determining when to effectively use augmented water flows to speed young fish through reservoirs.

Diseases also pose major problems for fish survival. In the Northwest, many researchers are studying fish disease prevention, diagnosis and treatment. For example, bacterial kidney disease is very common in spring chinook salmon. In fact it is difficult to find spring chinook without it. Jim Warren, regional fish health manager for the U.S. Fish and Wildlife Service, is working on a program that tests for the disease in adult fish coming to the hatchery, and then selectively mates those fish that are only minimally infected. Through coded wire tagging, Warren and others on the project are finding that the offspring of these matings have a return rate three times better than those from non-selective matings. Warren says the idea behind the program is to "amplify the best stocks, and minimize the worst ones."

Advances in the diet of hatchery fish are also occurring. In the 1960s, the development of the "Oregon Moist Pellet" diet was a revolution that allowed consistent and convenient hatchery fish feeding without exposing the fish to diseases previously present in fish foods. Such diet-related research is continuing. Researchers recently found that a meal made from chicken feathers is protecting fish against kidney disease. Now they are trying to figure out why.

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[1] A species is a group of individuals of common ancestry that closely resemble each other and that can interbreed, producing fertile offspring. A stock is a population of fish spawning in a particular stream during a particular season. Such fish generally do not interbreed with fish spawning in a different stream or at a different time.

Despite this successful detective work, there are many gaps that exist in our knowledge of Columbia River salmon and steelhead — areas where researchers don't have enough data to form theories. These are complex fish. They travel thousands of miles between freshwater rivers and saltwater oceans; they are affected by logging, urbanization, dam building and many other human activities; and during their migrations, they cross many political boundaries. The result of this complexity has been that coordinating the detective work necessary to fill in these knowledge gaps has not been easy.

There is a consensus among those who observe fisheries research that more coordination is needed if our knowledge of the fish is going to improve. Speakers at the Northwest Power Planning Council's Salmon and Steelhead Round Table this summer pointed out this need for coordination. Bill Bakke, the executive director of Oregon Trout, a sport-fishing group, stressed that "We need to integrate the research program. Rather than looking at boxes, we need to look at ... how various aspects of the research program interrelate, and how they work together for a bigger success."

Dr. Ray Hilborn of the University of Washington's Fisheries Research Institute went further in saying:

"We really don't know very much about what has happened on the Columbia River. We, for instance, don't know what kind of survival rates we get from hatcheries. We don't know how much of the production comes from hatcheries, how much comes from natural stocks. We don't know whether supplementation [using hatchery-bred fish to help replenish natural streams] *will work or not ... And there is a long tradition in fisheries management of taking action, doing things without really sitting down and evaluating whether it worked or not."*

"In order to reach the interim goal of doubling, we're going to have to be a lot more careful about understanding the effects of the actions, and there are going to have to be more people who simply sit there and ask questions about what actually happened."

In the 1987 Columbia River Basin Fish and Wildlife Program, a salmon and steelhead research and monitoring program was outlined to focus research by establishing overall areas of emphasis, provide a long-term research planning process and improve the participation of all parties in research planning.

Much of the research now being done is a result of measures in the program. Progress is being made, but a number of problems remain — problems such as improving the communication of research and monitoring results, improving the technical quality of research, and deciding on the mechanism to provide guidance in setting priorities and resolving disputes.

The Council, working with representatives of the Columbia Basin Fish and Wildlife Authority, the Bonneville Power Administration, the U.S. Army Corps of Engineers, the Pacific Northwest Utilities Conference Committee and others, recently developed an issue paper now being distributed for comment. It identifies major concerns in fisheries research and describes potential solutions. Public comment is being taken on the paper until mid-November. (See back cover to order a copy.) Through the comment received, the Council hopes to fine tune the research process.

It is essential to know more about salmon and steelhead if the Northwest is to reach the goal of doubling the Columbia River's salmon and steelhead runs. The detective work is being done in the basin, but with fine tuning it can be done better. As a famous detective would say "That's elementary, my dear Watson." ■

"We really don't know very much about what has happened on the Columbia River."
— Dr. Ray Hilborn

Dulcy Mahar Interview with

JOHN JONES

It has been five years since six Northwest natural gas companies filed suit against the Northwest Power Planning Council, charging that some of the Council's activities provided an unfair advantage for electricity over other fuels.

The lawsuit was settled out of court with neither party admitting error, but with both sides attesting to a new sensitivity to each other's needs and roles. Since that time, the gas industry has followed the Council's activities regularly, sending representatives to Council meetings, submitting testimony on a variety of issues and holding consultations with Council members. While both parties sometimes still disagree, both would likely agree on one thing—the relationship has matured and become more positive.

One industry representative who has worked most closely with the Council is John Jones, executive director of the Association of Northwest Natural Gas Utilities. Members of the Association, which is based in Portland, are Washington Natural Gas and Cascade Natural Gas, both based in Seattle; The Washington Water Power Company, Spokane; Northwest Natural Gas, Portland; CP National Corporation, Medford, Oregon; and Intermountain Gas Company in Boise.

The Association helps coordinate and develop programs to meet common needs and issues among its members. This includes information exchange, monitoring legislative and regulatory changes, developing issue positions, preparing testimony for hearings and rate cases, and maintaining liaisons with industry groups such as the American Gas Association and Gas Research Institute.

Jones "never expected to be employed by the natural gas industry, and I guess that is fairly typical of many of us who set a course for one thing and end up doing something different." (He said he wanted to be a fisherman when he grew up.)

Before joining the gas industry, Jones worked for the electric utilities, most recently Pacific Power & Light Company. One of his responsibilities at Pacific was drafting the proposal for and administering the Hood River Conservation Project, a $21-million contract to insulate approximately 3,100 electrically heated homes.

For the nine years prior to that experience, Jones was president of Energy and Man's Environment, an energy education corporation that conducted conferences and seminars throughout the country. He came to that position from the University of Puget Sound, where he was director of continuing education and professional studies, as well as an associate professor.

Jones holds a Ph.D. in administration from the University of Oregon, with undergraduate work in political science and pre-law from the university. He also attended Willamette University Law School, but found a future in law short-circuited when he "ran out of money."

Jones' family includes his wife, a special education teacher in Beaverton, a son in the military and a daughter who attends the University of Oregon. The family spends "most of our time getting wet backpacking in the Oregon rain forests."

How do Northwest gas companies fit into the regional power picture?

Illustration by Lynn Carson

Q. What role does the gas industry play in the Northwest power picture? What is the regional market share?

Our companies serve an area that is about the same as the Bonneville Power Administration's. It's generally from Canada to California and the Rocky Mountains to the Pacific Coast. We serve approximately 860,000 customers. About 740,000 are residential, 106,000 commercial, while interruptible and an interruptible-firm mix make up the total balance. It is about a $2.25 billion-a-year industry in terms of gas sales and transportation revenues.

We produce about as much energy for the region per annum on an equivalent Btu[1] basis as does the Bonneville Power Administration. This makes the natural gas industry a significant contributor to the region's energy needs.

Q. What percentage of new residential homes use gas?

That differs from service area to service area. One of our companies has most of its load in the commercial sector with a very small residential base; two others are heavily residential. The larger companies serving major metropolitan growth areas are getting about 90 to 95 percent of the new home hook-ups. That's primarily because of the cost of our fuel. Right now, on average, natural gas is approximately half the cost of electricity sold by the investor-owned electric utilities. It is a little bit more in some places, a little bit less in others.

Q. How is the gas brought in?

We have one major pipeline serving the region, and that is the Northwest Pipeline Corporation located in Salt Lake City. We have two primary producing areas—western Canada and the U.S. Southwest, principally the San Juan Basin. With both Canadian and U.S. producers and suppliers, we have a situation that provides our region with unusual leverage and flexibility. In that regard, the Northwest is completely different from any other part of the country. There are tremendous hydrocarbon resources in Canada; they need our markets, and we need their gas. It is an excellent arrangement.

> I believe a primary reason for the public misunderstanding regarding our commitment to conservation is that we don't have a Bonneville Power Administration with its large and aggressive promotion efforts.

Q. Since early 1986, gas and oil prices have been down. Does the gas industry see this as a plateau that is going to last for some time, or is it some point in a cycle?

The cost of natural gas is market driven. Traditionally, the price has been closely linked with the price of petroleum. While that relationship has not been entirely severed, the natural gas price has been largely decoupled from oil. This means that the rapid run-up of prices following OPEC's (Organization of Petroleum Exporting Countries) embargoes and the U.S. government's hasty legislative reactions are not likely to occur again.

In the short term, we can expect natural gas prices to remain relatively stable, with minor increases and decreases depending on supply and demand. In the mid-term there will probably be a steady but moderate increase in prices as pressures are applied to use more gas due to its positive environmental characteristics. I'm probably not smart enough to guess about the long term, beyond the 68-year proven reserves.

However, we have enormous gas supplies in the overthrust belt and tight sands[2] that will undoubtedly yield to new exploration and extraction technologies. The cost of exploration and delivery will be greater. But nothing would suggest that our costs would approximate those of new thermal electric generation. Given our expectations for the cost of electricity, we are taking the approach that we have an ideal fuel for many applications at a price that will be attractive compared with the cost of other energy options.

Q. What role does conservation play in your industry?

It is a question we believe is very important. It seems to be a commonly held opinion that the natural gas industry is in some way not interested in conservation, at least to the extent that the electric utilities and other industries are. It is important to note that we are obligated under the same state statutes as are the other energy providers to carry out and pursue energy conservation efforts. It is indeed a fact that every single one of our companies is actively involved in a variety of conservation efforts, such as providing retrofit services and making major investments in more efficient technology.

I believe a primary reason for the public misunderstanding regarding our commitment to conservation is that we don't have a Bonneville Power Administration with its large and aggressive promotion efforts. But that's not to say we don't have those same convictions about the importance of conservation.

Q. Originally you opposed the Council's model conservation standards. What were your reasons for opposing the standards then, and what is your position now?

I think it is important to say for the record that, although our industry's beginnings with the Power Council were initially a bit rough, the Association in general and our membership in particular have come to respect the Council and its staff and the work they're doing. It is fair to say that our attitude has changed as our insight has grown. The Council's effort to be evenhanded and objective, the open public process, the opportunity to take part in the process—all these things have helped our relationship.

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[1] British thermal unit is the amount of heat energy necessary to raise the temperature of one pound of water one degree Fahrenheit (3,413 Btus equal one kilowatt-hour).

[2] Overthrust belt and tight sand—Geological formations which are potentially rich in natural gas, but which also present drilling difficulties making them less economical currently.

I think that the genesis for the gas industry's initial opposition to the Council's work, especially in the area of building standards, was our need to make sure that the newly emerging conservation programs designed for the electric industry were not applied unfairly to the natural gas industry. If that had occurred, our industry would have been placed at a serious disadvantage competitively. That would not only have been hurtful to the gas industry, but hurtful to the region in general. Now let's deal with the natural gas industry's position vis-a-vis the model conservation standards.

The fundamental problem is that the assumptions that drive the cost-effective calculations for electricity don't apply to natural gas. The issue of avoided cost[3] is the foundation of that assumption. Obviously we don't build billion dollar electric generation facilities or construct power lines across the countryside. So, by applying the electricity-designed standards to gas, you're using the wrong assumptions for what is cost-effective to the region and the consumer.

The position of the natural gas industry regarding model conservation standards—and let's be right up front about it—is that we support the standards and believe they should be applied as they were designed to be used—to delay the construction of new, expensive electric generation facilities and buy us time. When you look at it from that point of view, then natural gas is making a major contribution to the conservation goals. By taking part of that new load growth, our industry is helping extend the time before new power plants have to be constructed. If, in fact, the standards had been applied to the gas industry, then that would have—by legislation—eliminated the cost advantage to the consumer and the reason why so much of the new heating load is going to gas. Much of that load would now be on the electric system.

If the model conservation standards had been applied to gas-heated homes, and with the cheaper up-front cost of electric forced-air heating systems, most of the new homes would have been built with electric forced-air or baseboard heat. All of that pressure that the gas industry relieved from the [overall power] system would have been placed on the electric system, which is to say that the conservation investment would have bought far less time, far less advantage than it has.

I think that diversity is extremely healthy for the region. If we put all of our eggs in one basket, be it the gas basket or electric basket or any other basket, we become vulnerable if there is any system failure.

As it is, we have a diverse [power] system. I think that diversity is extremely healthy for the region. If we put all of our eggs in one basket, be it the gas basket or electric basket or any other basket, we become vulnerable if there is any system failure. But right now we have several options. Greater flexibility is beginning to emerge in the discussions that the Council is having with regard to how to integrate gas into the regional mix.

We think it is time for the natural gas industry to be directly involved in discussion with the Council. We need to talk about how the uses of gas can best be played out for the purposes of the regional [North-

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[3] Avoided cost—An investment guideline describing the value of of a resource in terms of what is saved by not having to acquire a more expensive resource.

west Power] Act on behalf of the region.

I want to emphasize that the problems we have had have not necessarily been with the Northwest Power Planning Council directly. We've found the staff and the members over time to be very open and willing to talk and accepting of the concerns we've expressed. However, what we have experienced time and time again, is the good plans and the good ideas generated by the Council have been mutated by the Bonneville Power Administration into marketing efforts. Electric marketing efforts subsidized by public money tend to make my members cautious about their relationship with the Council and Bonneville.

We've appreciated the Council and will continue to express the basic point of view that we support the model conservation standards and the various programs designed to implement them, but they are designed for electricity and they should be applied in that sector. At the very same time, the natural gas industry is cooperating with a variety of agencies—energy offices, commissions, legislatures—to determine what is cost-effective for natural gas and to appropriately improve construction building standards.

Q. At the Hood River Conference you gave a position statement that suggested you could live with a dual code, that you weren't against codes.

We should have codes. We need to have a standard to live and practice by. We feel the states are handling that code-making process adeptly. Processes exist for public input and the careful consideration of what state codes should be. We participated in the last code cycles and felt very comfortable with the results.

In Washington, the process produced a dual code, one which provides exceptions based on what is cost-effective for gas as opposed to what is cost-effective for electricity. In Oregon, there is a single state code, but, recognizing the differences between our fuels, it provides for a single state code with an exception for high-efficiency gas furnaces and for the electric heat pump. We felt that was entirely acceptable.

We do think there may be some improvements to be made in the electric side of the code and perhaps on the natural gas side as well. But we have used the Council's own assumptions and its own program, working with the Oregon Department of Energy, and have rerun the cost-effective calculations. We find that in the states of Oregon and Washington we're just about at the limit of what should be done with natural gas, given current economics. We will continue to monitor the issue very closely.

Q. If the Council went after a fuel-blind code for model standards, then you would have to oppose it?

We would have to oppose fuel-blind codes because they are not in the best interests of either the consumer or the region. Fuel blind is really fuel dumb. Seeking fuel-blind codes would be an admission that the fairly applied cost-effective standard has been abandoned for some other purpose, primarily political. We're more than willing to abide by what is fair and equitable. That [fuel-blind code] is not only unfair and inequitable to the gas industry, but to our customers. It would deliver much of the new heating load to the electric utilities. It would accomplish legislatively what cannot be accomplished in fair marketplace competition. Yes, we would oppose any fuel-blind standard.

The bottom line is to create more competition through deregulation, and indeed that is beginning to happen. We don't know what the long-term effect will be.

Q. The Council has been discussing the greenhouse effect [see related story] and its implications for the power system. What is the gas industry's involvement in this issue?

Well, first let me say it is refreshing to have new members move through the Council from time to time. I understand that Mr. [Ted] Hallock, has brought the greenhouse discussion to the table. This is an issue which we believe may become increasingly important to all of us. We're all, of course, concerned about our environment and how to preserve it for future generations.

Our industry is not yet ready to make a policy statement. We recognize the issue as one that deserves attention and have employed the services of a research consultant to assemble available information from the scientific literature. We shared those findings with the region's scientific and energy leaders at a briefing this month. We heard two of the country's leading greenhouse specialists tell us what is currently known about the greenhouse effect and how it is likely to affect our future.

Q. There is media speculation that the greenhouse effect could be a boon to the gas industry.

Well, there is media speculation about nearly everything. We think this issue belongs, at this point, within the thoughtful scientific community. It does seem clear that the carbon dioxide load in the atmosphere is exacerbated by the industrial nations, principally through the burning of fossil fuels (coal, oil and the emissions from our vehicle fleets). Natural gas is a fossil fuel, but when compared with coal and petroleum, the combustion products are limited and more benign. To the extent that it is technically feasible, natural gas may provide us with an option to the use of dirtier fuels. Obviously there is a great deal more that must be known before any course of action is taken.

Q. There has been increasing discussion — both pro and con — about gas-fired turbines as a possible back-up to nonfirm power [see related story]. Do you have a viewpoint on this?

Obviously that is not a new technology. Outside this region, natural gas is a principal fuel for electric generation. We've been fortunate not to have to use this technology except in limited applications in this region because of our hydroelectric base. We have about 700 megawatts of combustion turbines already in place in the region. I believe that one of our members, the Washington Natural Gas Company, provides gas to Puget Sound Power & Light Company for its combustion turbines.

As we move into a period when we don't have that [electricity] surplus in the region, and if in fact we have not picked up options on the coal and nuclear or developed new hydro, all of which have some significant lead times, combustion turbines can be installed within a short period of time. Again, it goes back to the economics of the issue, and while it is completely doable, it is a question of whether it is the best thing to do in the region.

Q. What do you perceive to be the key issues your industry would be following with respect to the Council?

We need to investigate gas supply with you; we need to determine whether natural gas is a viable option in terms of deliverability to the region. We need to talk about how the various energy options can be integrated. We need to discuss the deregulation in our industry and how that affects traditional relationships. The issues run from the technical to the economic to the political; and they are inseparable.

Q. How do you see deregulation affecting your industry?

There is a major change in the way our industry operates. Under the old protocol, we had people who explored and produced gas, and pipelines that brought it from the region where it was being produced and delivered it to areas where it was needed. The local distribution company took the gas and, through its own system, delivered it to the burner tip at the home or the commercial establishment or the industry where it was used in heating, processing or other end-use applications.

In the new deregulated environment, any one of the members of that old conventional structure may be doing any one of those functions. For example, we may have a local distribution company that goes directly to a producer, buys the gas and hires the transportation of that gas from the pipeline. We might have a customer that goes directly to the pipeline and, having found its own gas, hires the pipeline to deliver it. And the pipeline may or may not go through the local distribution company. It may build its own pipeline directly to a customer. Almost any permutation is possible. That seems to have been FERC's [Federal Energy Regulatory Commission] intent.

Of course the bottom line is to create more competition through deregulation, and indeed that is beginning to happen. We don't know what the long-term effect will be. Right now there is a good deal of confusion. This almost always happens when an industry is suddenly unstuck from the conventions by which it has been operating. Our industry is still working very closely with the FERC and certainly with our local regulatory agencies in trying to determine new rules and procedures under the new protocol.

If you ask that question six months from now, I may be able to tell you a little more definitely what is happening as far as the economics. We are not sure what the result will be, except that business will never be conducted as it has been in the past.

Q. What are the key topics before the gas industry now? Obviously you've touched on some.

We've just talked about deregulation and, springing from that, new relationships between and among our own industry members. We'll also be looking at the institutional relationships between the Canadian markets with the new economic structure being established for trade between our country and Canada.

New technologies are of great interest in our industry. We're obviously interested in the breakthroughs in research and exploration technologies that are going to extend the lifetime of our reserves and which will make us increasingly able to compete in the market. Natural gas-powered transportation is a near certainty. We'll soon have competitive natural gas cooling systems.

And I think that the emerging issue of least-cost planning will be a topic. It is one that has had its genesis in the electric side of the energy business, but we have to assume that that same kind of interest will eventually be applied to the natural gas industry, and we're planning to accommodate that.

I guess we'd also have to say that a greater role in regional planning is a key issue. And it seems to us that we have a responsibility and an ever greater role to play. How that is going to be worked out is still unclear. We see that working with the Council is an absolute key, and we're pursuing that in a variety of different ways.

Managing our future rather than allowing the future to happen is something I think will benefit all of us.

Q. What do you see as the most important role for the Council and what should it be doing?

First of all, I think it is absolutely true that had the Power Council not been formed, it is unlikely that the diverse and varied energy, industry, public and environmental interests in this region would have come together. As a result, the constructive forum for dialogue on the many major issues in this region would not have taken place. Or if they had taken place at all, they would have been piecemeal, and the coordination and consolidation of those issues into a reasonable and prudent plan probably would not have occurred. The Council's existence may minimize the potential for notable planning failures such as we have experienced in the recent past.

So I think that the bottom line is that, although we may disagree from time to time with individual things that are done at the Council, citizens of the region do have a forum that all of us can use. The Council is an opportunity to inform ourselves and try to make sense out of how we're going to manage our future. Managing our future rather than allowing the future to happen is something I think that will benefit all of us. Right now the Council is the pin holding the fabric together. So we see the Council as an extremely important element in this region. The public process that the Council has insisted on is, we think, probably the hallmark of its existence.

> We would have to oppose fuel-blind codes because they are not in the best interests of either the consumer or the region. Fuel blind is really fuel dumb.

If I were to guess about the long-term future, I would suspect that the Council will have made a major contribution to the restoration of our fish resource, and it will have re-established and reconfirmed our regional commitment to environmental integrity. The Council will probably be held up in great esteem for the work it has done. And we in the gas industry are going to, for the benefit of the Council and for that long term, insist that we be part and parcel of the process.

Maybe natural gas has a key role to play in this time of transition. It will be interesting to look back and see whether anything we suspect is right in the long term. But we can only do what we can dream about and what we can know. I think the Council is an ideal place for that to take place. We in the gas industry would like to see the Council broaden its scope and become a little bit more neutral, understanding full well that the politics of that situation may be difficult to accomplish. But then again, most things worth doing are difficult. ■

Water conservation may help both irrigators and fish runs.

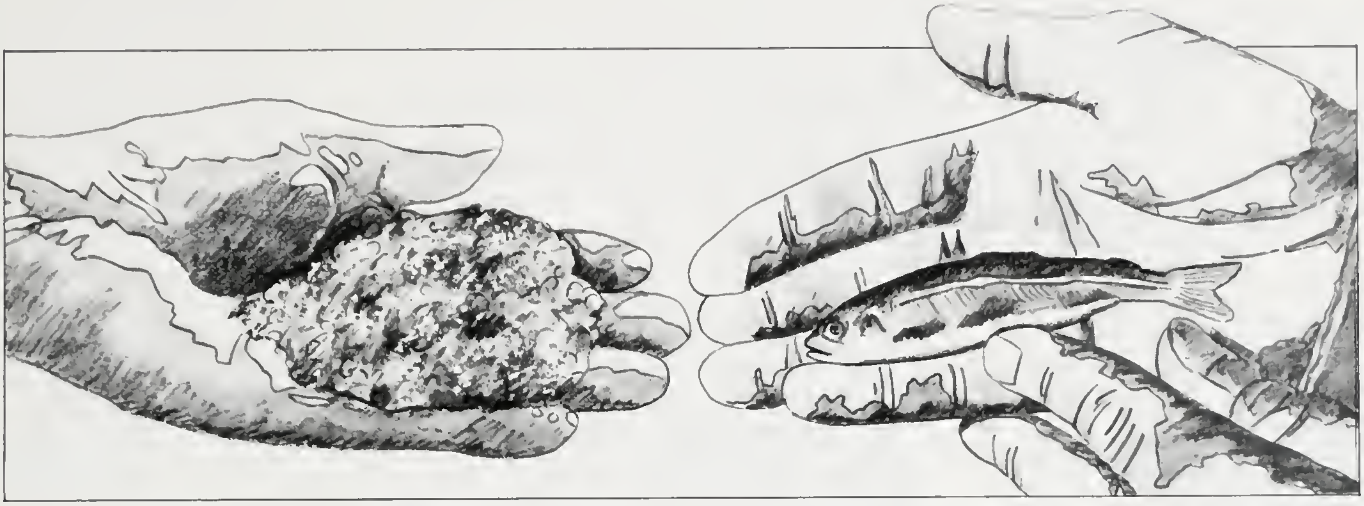


Illustration by Lyn Nance

Wise Use for Western Water

by Barbara Taylor
and Carlotta Collette

The wide open spaces between the Mississippi River and the bony spine of mountains stretching from Canada to Southern California were an irresistible temptation to hopeful farmers arriving in post-Civil War America. For a string of years, beginning in 1865, there was abundant rain in the previously arid West. The deep-rooted grasses of the plains greened up, prompting farmers to suppress their doubts about working a land that had little else growing on it. While there were no trees for fence posts, there were also no trees to cut down and no stumps to dig. There was even a theory, shared like religious doctrine, that the act of farming itself would bring continued rainfall.

The Homestead Act of 1862, which authorized the sale of 160-acre plots of land to migrating Americans and immigrating Europeans, nurtured the dream of the tillable prairies. In two decades, the open spaces had diminished and small towns had appeared in the middle of what had been and was already becoming again a vast desert. In the 1880s, the West's more common weather reasserted itself. For nearly two more decades, drought conditions were the rule, not the exception.

In recent years, droughts have pushed conflicting water demands onto the front pages of newspapers.

It was one thing to be a farmer with access to one of the streams crisscrossing the desert. They had a chance to make a go of it, unless the stream dried up. Water law in the West was pretty straightforward; first in time, first in right. But downstream and newly arrived users had precarious claims to the water they needed. Water rights were described in terms of "senior" appropriators and "junior" appropriators. Throughout most of the West, that basic tenet of water law and the assigned status of users still dominates. Indian tribes have reserved rights to water that supersede most other distributions.

But the simple fact of the western United States is that this vast landmass, about 60 percent of the lower 48 states, has only 25 percent of the nation's precipitation. And that falls between autumn and spring. Most of the West has very little summer rainfall to slake the thirst of parched plants during their fastest growing periods.

By the turn of the 20th century, there was an obvious if somewhat late realization that there would be no farm belt on the nation's frontier without irrigation. And irrigation carried out at the local, privately financed level had already failed, in most cases, miserably. The hopes and dreams of so many people, and the larger plan to actually make the western lands productive despite the limited moisture, required coordinated development. Water was fundamental to the West's survival as a region, but too costly to manipulate on the grand scale envisioned to be financed by individuals and local governments.

But the simple fact of the western United States is that this vast landmass has only 25 percent of the nation's precipitation.

In 1902, the federal government created the Bureau of Reclamation, whose mandate was to use proceeds from public land sales to finance a series of diversion and storage dams and canals that would eventually result in millions of acres of desert bursting into bloom. Western water development since 1902 has been the most ambitious and elaborate federal construction program ever conceived. Grand Coulee and Hoover dams are just the two biggest projects. Hundreds more dot the region, pulling water from the three major western watersheds — those of the Columbia, Colorado and Missouri rivers — and pumping it out across thousands of miles of dry land.

There is no question that much of what the Bureau of Reclamation (and with it the U.S. Army Corps of Engineers) did to the West was remarkably positive. Here in the Northwest, about 75 percent of the region's agricultural production comes from the arid land east of the Cascade Mountains. In Washington's Yakima Valley, agricultural products earn between $300 million and $400 million annually. From the shifting sands of the Umatilla River Basin in northeastern Oregon, a much smaller valley than the Yakima, farmers bring in more than $50 million each year.

But citizens of the region are also well aware that the price paid for such success and for the simultaneous development of the rivers for hydropower production may be more than anyone bargained for. Today, agriculture accounts for 88 percent of the West's water consumption. In most states, it is perfectly legal to draw *all* of a stream's flow for irrigation. Under certain circumstances, farmers can block streams off, diverting the flows into their fields. Until recently, few states regarded as critical the need to keep water in rivers for fish, wildlife and other purposes.

In the Northwest, one effect of such management is that river basins that once supported vital runs of salmon and steelhead, such as the Yakima and Umatilla basins mentioned above, now only host remnant runs, if any at all. Whole communities that depended on the fisheries for their sustenance have been unsettled. This is particularly true for Indian communities.

Furthermore, the West's voracious appetite for water has not been quenched. Some agricultural areas in the region are slated for expansion. At the same time, urban areas are growing and industries are moving in from across the continent and from Pacific Rim nations. This places extra burdens on the region's water, both to generate the hydroelectricity that supplies about three-quarters of the Northwest's power needs and to lubricate economic growth.

On top of all of this, today's Northwesterners have another waterborne dream — to recover, or at least attempt to double the Columbia River Basin's salmon and steelhead runs depleted by 50 years of hydroelectric dams. The Northwest Power Planning Council's Columbia River Basin Fish and Wildlife Program includes over 200 activities aimed at that goal. And this dream, too, will require the coordinated efforts of federal, state and local governments, Indian tribes and individuals, and the steady rush of water.

In recent years, droughts have pushed these conflicting water demands onto the front pages of newspapers in every state. The states are responding with new legislation and water conservation programs. In Idaho, Montana, Oregon and Washington, actions are being taken to encourage more efficient use of existing water supplies. Policies, programs and even water laws are changing. In Oregon, a new law permits irrigators to sell, lease or use some of the water they are able to salvage through irrigation improvements. A quarter of the water saved through such efficiencies must be returned to the stream for fish, wildlife and other instream uses.

In Washington, a similar law was passed. The new legislation also established a Joint Select Committee on Water Resource Policy to review existing state laws and recommend new statutes.

Both Idaho and Montana are evaluating their state water laws and needs in the process of developing statewide water-use plans. Idaho is expected to designate certain streams for specific uses and adopt actions to protect or improve conditions to support the desired uses. Idaho is also engaged in a general adjudication of water rights in that state's Snake River Basin.

Most of the state actions incorporate plans to make more efficient use of irrigation water. These plans generally suggest: 1) lining irrigation canals and other distribution

Fast-growing willows and other plant matter protect streamsides from erosion and provide shade to keep water temperatures cool.

Photograph by Carlotta Collette

systems to reduce water loss in transit; 2) improving irrigation management so the required moisture is applied at the time and depth required by the plants; 3) altering cultivation and tilling practices to reduce water needs and minimize erosion; and 4) replanting and restoring stream channels to improve water storage within the riparian (streamside) zones.

In the Umatilla Basin, farmers following some or all of the above procedures have reduced their water use 20 percent to 30 percent, depending on the crops. The Umatilla work, funded and coordinated by the Umatilla Electric Cooperative, which serves some 200,000 acres of irrigated land in Umatilla and Morrow counties, has been in progress since 1982. Approximately three-quarters of the cooperative's electrical load comes from agricultural uses: 40 percent from irrigation; 30 percent from food processing.

Farmers in the Umatilla project are finding they not only save water and consequently lower their electric bills, but they also increase crop quality and yields because of reduced stress on plants. Since there is less leaching of fertilizers, applications of these chemical soil improvements can also be cut.

The Umatilla irrigators are part of that basin's collaborative attempt to recover wild spring chinook runs that once flourished there. This year, the first adult spring chinook,. released as fry in upper basin streams over the past years, returned to the Umatilla to spawn.

Such success is leading other water-constricted basins to follow Umatilla's example. But water conservation comes with its own set of physical, legal and institutional complexities that need to be addressed before the region will be truly making the most efficient use of its most valuable resource.

In the first place, western water law discouraged water conservation. In the West, it's considered wasteful to *not* use up the resource. Traditionally, if a farmer increased the efficiency of his or her irrigation system, the water saved could not be applied to new lands or sold. It had to remain in the stream for the next user in line. Furthermore, if farmers conserved water and thus did not use their full entitlement, they faced the possibility of having the entitlement reduced by the amount of water conserved.

There was also no economic rationale for conserving water. Many irrigation distribution systems were built when construction costs were subsidized substantially by the Bureau of Reclamation or other government agencies. From the farmer's perspective, these systems were inexpensive, and the water and power to pump it were apparently abundant. Efforts to make the systems more efficient were considered uneconomical. Now, the costs for improvements are increasing and may outweigh any immediate benefits from the efficiency measures.

Moreover, water conservation can affect users further downstream. In many cases, water that currently is "wasted" by returning to the stream is taken up by junior appropriators. If the senior user makes better use of less water, the downstream user could have less return flow to draw on.

It's also difficult to create water savings that can then be counted on for fish or other needs in specific locations, because much of the water poured out on the land seeps in and travels underground some distance before it re-enters the stream.

Some water conservation actions may even have negative effects on fish and wildlife. In some cases, water from over-abundant applications creates wetlands, springs, small streams and other habitat where runoff collects or groundwater emerges. These areas may provide important habitat for fish and wildlife, such as waterfowl, which rely on the resulting vegetative growth. These areas could dry up if more conservative amounts of water are dispersed. It is estimated that when the delivery system for the Yakima-Tieton Irrigation District was converted from a system of open canals to enclosed pipes, approximately 30 percent of the wetland acreage on the project was eliminated. Such problems likely can be reduced by incorporating the need for the wetland in any conservation plans.

> Western water use is changing. In Idaho, farmers "deposit" unused water appropriations in a "bank," typically a reservoir. Other users borrow the water at a price set by the Bureau of Reclamation.

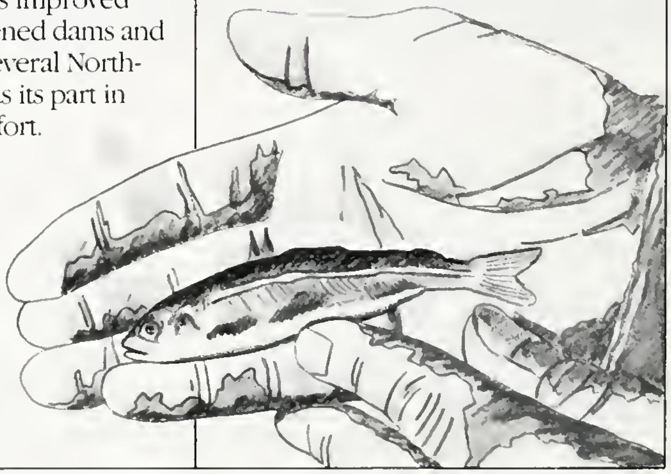
Despite these complications, western water use is changing. In Idaho's Upper Snake River Basin, a "water bank," long used informally, has been sanctioned legally to allow farmers to "deposit" their unused water appropriations in a "bank," typically a reservoir. Other users may then borrow the water at a price set by the Bureau of Reclamation. Idaho's model could serve many other areas where farmers' water allotments are in excess of their need.

The Bureau of Reclamation has even changed its primary mission. In 1987, the Bureau announced that its years of building giant water systems were over. The new mission stresses improved resource management. Future Bureau projects are likely to be much smaller and designed to optimize existing facilities. Efficiency is the Bureau's new guiding principle. Working with local irrigators, Indian tribes, state and federal fish agencies and others, the Bureau has improved fish ladders and screened dams and irrigation outlets in several Northwest river drainages as its part in the fish restoration effort.

In addition, the Northwest Power Planning Council's Columbia River Basin Fish and Wildlife Program has resulted in more than 80 streamside enhancement projects that have increased water storage capabilities in affected floodplains. These projects, designed to improve conditions for wild runs of salmon and steelhead, combine actions to stabilize stream banks, revegetate riparian areas, control erosion, increase the number and size of resting pools and provide protective fencing to keep cattle from grazing on fragile stream banks. Water quality is also improved.

In 1931, before any federal dams had been built across the Columbia, Justice Oliver Wendell Holmes said, "A river is more than an amenity, it is a treasure. It offers a necessity of life that must be rationed among those who have power over it." Now, more than half a century later, farmers, fishers and ratepayers in the Northwest are listening to that lesson and beginning to abide by it.

Barbara Taylor is a planner in the Council's fish and wildlife division.



CALENDAR

November 12-13 — "Northwest Rivers Conference — Citizen Involvement in River Protection Programs," in Seattle, Washington. Sponsored by the Northwest Rivers Council. For more information: Northwest Rivers Council, P.O. Box 88, Seattle, Washington 98111, 206-932-6587.

November 18-19 — "Celebrate America's Rivers," a national conference in honor of the 20th anniversary of the national Wild and Scenic Rivers System, in Alexandria, Virginia. For more information: Suzanne Wilkins, Kevin Coyle or Ken Olson, American Rivers, 202-547-6900.

November 18-19 — "The Public Trust and the Waters of the American West: Yesterday, Today and Tomorrow," a continuing education conference at Lewis and Clark College in Portland, Oregon. For more information: Laurie Mape, Northwestern School of Law of Lewis and Clark College, 10015 S.W. Terwilliger Boulevard, Portland, Oregon 97219, 503-244-1181, extension 629.

November 29-December 3 — "Housing for the 90s" at the Sheraton Tacoma Hotel, Tacoma, Washington. Sponsored by the Energy Business Association. For more information: Patricia Anderson, Energy Business Association, 420 Maritime Building, 911 Western Avenue, Seattle, Washington 98104, 206-622-7171.

December 13 — "1988 Electricity Futures Symposium" at the Jantzen Beach Red Lion Inn in Portland, Oregon. Sponsored by the Northwest Power Planning Council, the Bonneville Power Administration and the League of Women Voters of Oregon. For more information: Bonneville Power Administration, P.O. Box 12999, Portland, Oregon 97212, 503-230-3478, 800-452-8429 in Oregon, 800-547-6048 in other western states.

December 14-15 — Northwest Power Planning Council meeting at the Council's central office in Portland, Oregon.

A more detailed calendar of Council committee meetings and consultations is carried each month in Update! See order form on back cover.

Compiled by Ruth L. Curtis

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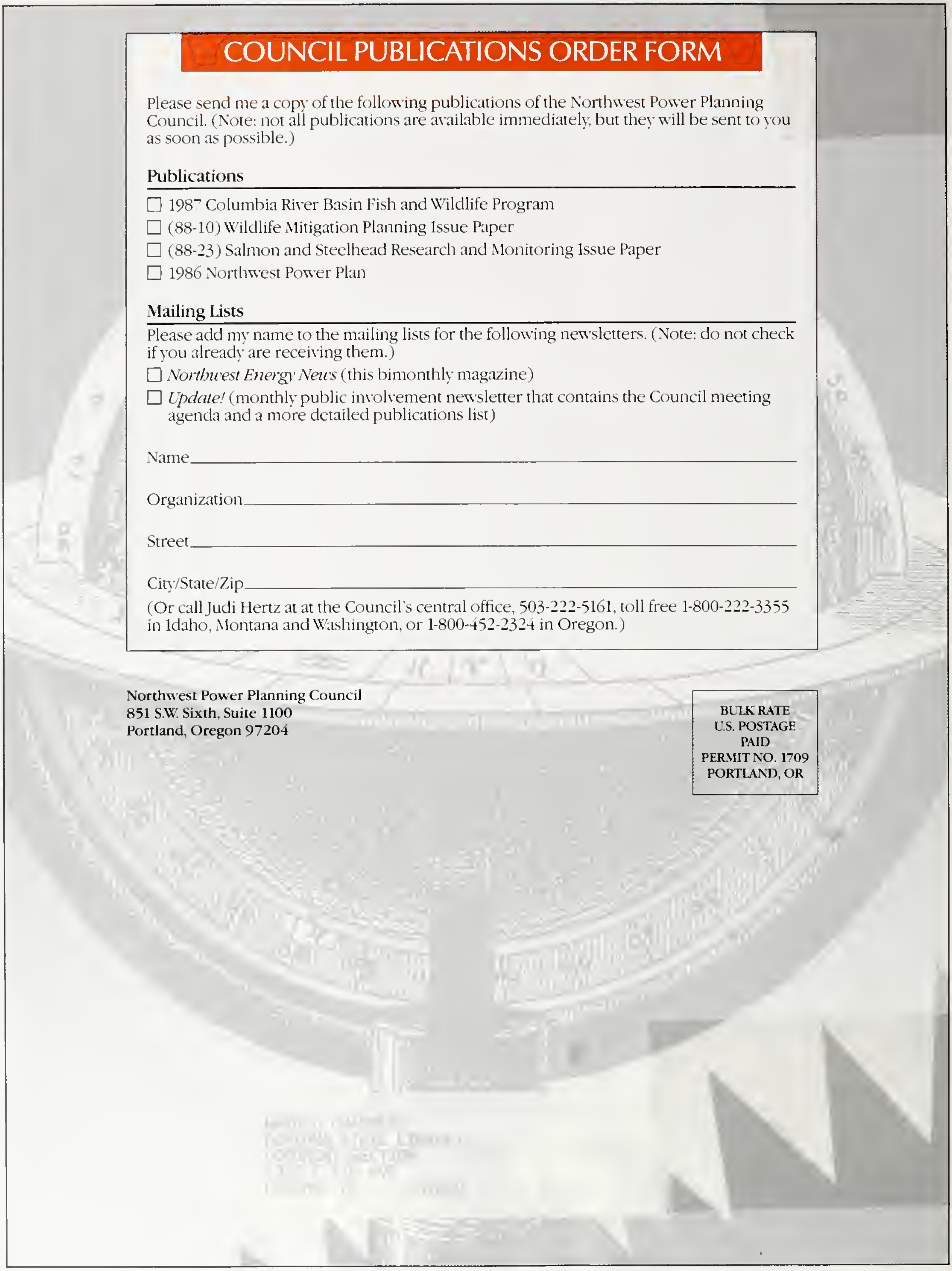

COUNCIL PUBLICATIONS ORDER FORM

Please send me a copy of the following publications of the Northwest Power Planning Council. (Note: not all publications are available immediately, but they will be sent to you as soon as possible.)

Publications

☐ 1987 Columbia River Basin Fish and Wildlife Program
☐ (88-10) Wildlife Mitigation Planning Issue Paper
☐ (88-23) Salmon and Steelhead Research and Monitoring Issue Paper
☐ 1986 Northwest Power Plan

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☐ *Northwest Energy News* (this bimonthly magazine)
☐ *Update!* (monthly public involvement newsletter that contains the Council meeting agenda and a more detailed publications list)

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(Or call Judi Hertz at at the Council's central office, 503-222-5161, toll free 1-800-222-3355 in Idaho, Montana and Washington, or 1-800-452-2324 in Oregon.)

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